Vol. 1039 Number 4

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

Route to:

PATENTS

February 28, 1984

U.S. DEPARTMENT OF COMMERCE

Patent and Trademark Office

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

February 28, 1984 Volume 1039 Number 4

CONTENTS

		Page
Patent and Trademark Office Notices		
Patent Cooperation Treaty (PCT) Information	1039 OG	150
Board of Appeals Decisions	1039 OG	150
Reissue Applications Filed	1039 OG	150
Requests for Reexaminations Filed	1039 OG	150
Notice of Availability for Licensing	1039 OG	151
PTO Status	1039 OG	152
Patent Certificates of Correction	1039 OG	153
Disclaimers	1039 OG	153
Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries	1039 OG	154
Condition of Patent Applications	1039 OG	155
Reexaminations		1375
Reissue Patents Granted (31,525)		1377
Plant Patents Granted (5,195)		1379
Patents Granted		
General and Mechanical (4,433,439)		1381
Chemical (4,433,975)		1565
Electrical (4,434,318)		1657
Design Patents Granted (272,769)		1723
Index of Patentees		PI 1
Indices of Reissue, Reexamination, Design and Plant Patentees		PI 40
Classification of		
Patents (Including Reissues and Reexaminations)		PI 43
Designs and Plants		PI 45
Geographical Index of Residence of Inventors		
Patents (Including Reissues)		PI 46
Designs and Plants		PI 47
Change of Address Form and Subscription Order Form		Back Page

The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.

THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.

GENERAL INFORMATION concerning PATENTS.

GENERAL INFORMATION concerning TRADEMARKS.

PRINTED COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.00 each; PLANT PATENTS in color, $8.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1037 O.G. 12 on Dec. 13, 1983. For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Domestic PCT fees were increased on Oct. 1, 1982 by a rule change to 37 CFR 1.445 that was published at 1021 O.G. 11 on Aug. 10, 1982. International PCT fees were changed by the PCT Assembly effective Jan. 1, 1984 and were announced at 1037 O.G. 12 on Dec. 13, 1983. The search fee for the European Patent Office was changed as of Feb. 14, 1984 and was announced at 1039 O.G. 142 on Feb. 21, 1984.

The current schedule of PCT fees is as follows:

Transmittal fee	$ 125.00
Search fee	
U.S. Patent and Trademark Office as Searching Authority	
· No corresponding prior U.S. national application filed	500.00
· Prior corresponding U.S. national application filed	250.00
European Patent Office as Searching Authority	
· All cases	620.00
International Fees	
Basic fee (first 30 pages)	295.00
Basic Supplemental fee (for each page over 30)	6.00
Designation fee (for each national or regional office)	70.00

GERALD J. MOSSINGHOFF,
Jan. 30, 1984. *Commissioner of Patents and Trademarks.*

Board of Appeals Decisions Rendered in the Month of Jan. 1984

Affirmed	219
Affirmed in Part	24
Reversed	75
Total	318

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,859,527, Re. S.N. 558,394, Filed Dec. 5, 1983, Cl. 250/327.2, APPARATUS AND METHOD FOR PRODUCING IMAGES CORRESPONDING TO PATTERNS OF HIGH ENERGY RADIATION, George W. Luckey, Owner of Record: *Eastman Kodak Co., Rochester, N.Y.,* Attorney or Agent: John D. Husser, et al., Ex. Gp.: 256

4,158,431, Re. S.N. 533,838, Filed Sept. 19, 1983, Cl. 235/304.1, SELF-TEST FEATURE FOR APPLIANCES FOR ELECTRONIC SYSTEMS OPERATED BY MICROPROCESSOR, Michael G. van Bavel, et al., Owner of Record: *Texas Instruments Inc., Dallas, Tex.,* Attorney or Agent: John G. Graham, Ex. Gp.: 236

4,305,027, Re. S.N. 558,689, Filed Dec. 6, 1983, Cl. 318/4, MULTIPLE WINDINGS ELECTRICAL MACHINES, John T. R. Wilson, Owner of Record: *Inventor,* Attorney or Agent: Robert A. Green, et al., Ex. Gp.: 212

4,307,143, Re. S.N. 563,713, Filed Dec. 20, 1983, Cl. 252/91, MICROFIBER OIL AND WATER WIPE, Gary H. Meitner, Owner of Record: *Kimberly-Clark Corp., Neenah, Wis.,* Attorney or Agent: William D. Herrick, et al., Ex. Gp.: 166

4,308,400, Re. S.N. 564,552, Filed Dec. 22, 1983, Cl. 568/336, SENSITIZERS FOR PHOTOPOLYMERIZATION, Louis Feider, (Deceased), et al., Owner of Record: *Ciba-Geigy Corp., Ardsley, N.Y.,* Attorney or Agent: V. M. Creedon, et al., Ex. Gp.: 215

4,314,728, Re. S.N. 560,326, Filed Dec. 12, 1983, Cl. 297/300, CHAIR CONTROL, Frederick S. Falks, Owner of Record: *Steelcase, Inc., Grand Rapids, Mich.,* Attorney or Agent: Peter P. Price, et al., Ex. Gp.: 355

4,315,770, Re. S.N. 565,342, Filed Dec. 27, 1983, Cl. 75/0.5BC, DISPERSION STRENGTHENED METALS, Anil V. Nadkarni, Owner of Record: *SCM Corp., Cleveland, Ohio,* Attorney or Agent: Robert A. Sturges, Ex. Gp.: 111

4,361,509, Re. S.N. 563,795, Filed Dec. 21, 1983, Cl. 260/112.B, ULTRAPURIFICATION OF FACTOR VIII USING MONOCLONAL ANTIBODIES, Theodore S. Zimmerman, et al., Owner of Record: *Scripps Clinic and Research Foundation, La Jolla, Calif.,* Attorney or Agent: George B. Finnegan, Jr., et al., Ex. Gp.: 143

4,366,524, Re. S.N. 563,790, Filed Dec. 21, 1983, Cl. 361/154, ELECTROMECHANICAL TRANSDUCER CONTROLLING DEVICE, Hiroshi Kuroiwa, et al., Owner of Record: *Hitachi Ltd., Tokyo, Japan,* Attorney or Agent: Donald R. Antonelli, Ex. Gp.: 212

4,388,290, Re. S.N. 562,054, Filed Dec. 16, 1983, Cl. 423/468, PURIFYING THIONYL CHLORIDE WITH $AlCl^3$ CATALYST, Gerhard Jonas, Owner of Record: *Bayer Aktiengesellschaft, Leverkusen, Germany,* Attorney or Agent: Arnold Sprung, et al., Ex. Gp.: 113

4,405,290, Re. S.N. 562,793, Filed Dec. 19, 1983, Cl. 417/282, PNEUMATIC SUPPLY SYSTEM HAVING VARIABLE GEOMETRY COMPRESSOR, George C. Rannenberg, Owner of Record: *United Technologies Corp., Hartford, Conn.,* Attorney or Agent: John Swiatocha, et al., Ex. Gp.: 343

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

D. 236,535, Reexam. No. 90/000,492, Requested: Jan. 23, 1984, Cl. D26/28, VEHICLE LIGHT, Harold H. Larsen, et al., Owner of Record: *Bates Industries, Inc., Long Beach, Calif.,* Attorney or Agent: Fuliwider, Patton, et al., Ex. Gp.: 291, Requester: Herbert C. Brinkman, Cincinnati, Ohio

4,092,181, Reexam. No. 90/000,494, Requested: Jan. 30, 1984, Cl. 148/12.7A, METHOD OF IMPARTING A FINE GRAIN STRUCTURE TO ALUMINUM ALLOYS HAVING PRECIPITATING CONSTITUENTS, Neil E. Paton, et al., Owner of Record: *Rockwell International Corp., Thousand Oaks, Calif.,* Attorney or Agent: Craig O. Malin, Ex. Gp.: 111, Requester: Rockwell International Corp., Thousand Oaks, Calif.

4,283,495, Reexam. No. 90/000,491, Requested: Jan. 23, 1984, Cl. 435/240, ROLLER BOTTLE, Robert W. Lynn, Owner of Record: *Becton Dickinson Co., Rutherford, N.J.,* Attorney or Agent: R. J. Rodrick, Ex. Gp.: 170, Requester: James W. Badie, New York, N.Y.

4,293,140, Reexam. No. 90/000,493, Requested: Jan. 25, 1984, Cl. 280/154, AUTOMOBILE SPLASH GUARD AND ATTACHMENT MEANS THEREFORE, Ted A. Bell, et al., Owner of Record: *Pretty Products, Inc., Coshocton, Ohio,* Attorney or Agent: Robert E. Stebens, Ex. Gp.: 310, Requester: Powerflow, Inc., Buffalo, N.Y.

4,404,158, Reexam. No. 90/000,488, Requested: Jan. 19, 1984, Cl. 264/263, METHOD OF MAKING A BUILDING PANEL, Ralph C. Robinson, Owner of Record: *Olympian Stone Co., Redmond, Wash.* Attorney or Agent: James R. Uhlir, Ex. Gp.: 140, Requester: William M. Hynes, San Francisco, Calif.

U.S. GOVERNMENT-OWNED INVENTIONS

Notice of Availability for Licensing

The inventions listed below are owned by agencies of the U.S. Government and are available for licensing in the U.S. in accordance with 35 U.S.C. 207 to achieve expeditious commercialization of results of federally funded research and development. Foreign patents are filed on selected inventions to extend market coverage for U.S. companies and may also be available for licensing.

Technical and licensing information on specific inventions may be obtained by writing to:

Office of Government Inventions and Patents
U.S. Department of Commerce
P.O. Box 1423
Springfield, Va. 22151

Please cite the number and title of inventions of interest.

DOUGLAS J. CAMPION,
Patent Licensing,
Office of Government Inventions and Patents
National Technical Information Service
U.S. Department of Commerce.

DEPARTMENT OF AGRICULTURE

SN 6-245,464 (4,416,881). INSECT REPELLENTS EMPLOYING CYCLOHEXANE-CARBONYL MORPHOLINE COMPOUNDS.

SN 6-294,096 (4,416,069). ENHANCEMENT OF COLOR QUALITY OF LUMBER DURING DRYING.

SN 6-367,638 (4,415,350). AUXIN COMPOSITIONS OF PHENYL THIOESTERS OF INDOLE-3-ALKANOIC ACIDS AND THEIR USE AS AUXIN GROWTH REGULATORS.

SN 6-367,639 (4,411,684). AUXIN COMPOSITIONS OF N-PHENYL AND N-CHLORO PHENYL INDOLYL-3-ALKYLENE AMIDES AND THEIR USE AS AUXIN GROWTH REGULATORS.

SN 6-409,268 (4,414,084). PROCESS FOR CONVERSION OF CELLULOSE TO AMINO ACIDS BY RADIOFREQUENCY PLASMA OF NITROGEN AND HYDROGEN.

SN 6-464,530 (4,413,997). DICARBAMOYL-SULFONATE TANNING AGENT.

SN 6-496,518. OVA HARVESTING SYSTEM.

SN 6-507,192. CONTROL OF INSECTS.

SN 6-530,829. TRANSPORT CARRIAGE.

SN 6-532,411. FOREST FIRE RATE OF SPREAD TIMER AND METHOD.

SN 6-539,027. ADJUSTABLE SHEAVE WHEEL.

SN 6-543,730. PROCESS AND COMPOSITIONS FOR PRESERVING FRESH HIDES AND SKINS.

DEPARTMENT OF HEALTH & HUMAN SERVICES

SN 6-250,840 (4,415,807). CROSS-SLICE DATA ACQUISITION SYSTEM FOR PET SCANNER.

SN 6-271,271 (4,416,662). ROLLER INFUSION APPARATUS.

SN 6-315,271 (4,414,108). APPARATUS AND METHOD FOR CONTINUOUS COUNTERCURRENT EXTRACTION AND PARTICLE SEPARATION.

SN 6-325,730 (4,413,985). HYDROCEPHALIC ANTENATAL VENT FOR INTRAUTERINE TREATMENT (HAVIT).

SN 6-338,537 (4,416,871). INHIBITION BY PEPTIDES OF TOLERANCE TO AND PHYSICAL DEPENDENCE ON MORPHINE.

SN 6-389,118 (4,412,066). POLYMER BOUND DYES PREPARED BY DIAZO COUPLING REACTIONS WITH POLY(ORGANOPHOSPHAZENES).

SN 6-402,353 (4,416,761). MULTI SLAB GEL CASTING ELECTROPHORESIS APPARATUS.

SN 6-537,572. STIMULATION OF ENZYMATIC LIGATION OF DNA BY HIGH CONCENTRATIONS OF NONSPECIFIC POLYMERS.

DEPARTMENT OF THE AIR FORCE

SN 6-263,629 (4,407,705). PRODUCTION OF NEGATIVE IONS OF HYDROGEN.

SN 6-404,725. A RECHARGEABLE SECONDARY BATTERY HAVING AN ALUMINUM SALT ELECTROLYTE.

SN 6-515,834. BLIND-MATING, POSITIONALLY ADJUSTABLE ELECTRICAL CONNECTION DEVICE.

SN 6-532,862. MOUNTING DEVICE.

SN 6-533,331. ELECTRONIC NERVE AGENT DETECTOR.

SN 6-534,996. HEAT MANAGEMENT SYSTEM FOR AIRCRAFT.

SN 6-536,142. DIFFUSE INCANDESCENT RUNWAY MARKER LIGHT APPARATUS FOR OVERT/COVERT OPERATION.

SN 6-538,872. MEANS FOR ALIGNING ELEVATION BEAM PATTERN ALONG AN ISODOP IN SYNTHETIC APERTURE MAPPING RADAR.

DEPARTMENT OF THE ARMY

SN 6-538,633. ALIGNMENT TRANSFER AND VERIFICATION SCHEME FOR A PORTABLE LAND NAVIGATION SYSTEM.

SN 6-539,201. LINER-PROPELLANT BOND TESTS.

SN 6-544,144. PROTECTIVE MASK FOR AIRBORNE TOXIC SUBSTANCES.

SN 6-544,770. METHOD OF PRETREATING CARBON BLACK POWDER TO IMPROVE CATHODE PERFORMANCE AND LITHIUM SULFURYL CHLORIDE CELL INCLUDING THE PRETREATED CARBON BLACK POWDER.

Status of PTO Services

The following is an update of the status of PTO services for January 1984:

Service Item	FY 1984 Performance Goal (Calendar Days)	Actual	Comment
Filing Receipts:			
Patents	22	34	Problems were encountered in conversion to the new computer system.
Trademarks	30	40	
Patent/Trademark Copies:			
Window Coupons	5	94% within 5 days	
Mail Coupons	29	99% within 29 days*	
Letter Orders	34	99% within 34 days*	
Date of oldest unfilled order		Nov. 18, 1983	
Certified Copies:			
Trademark Registrations	30	10	
Applications-As-Filed	20	99% within 15 days	
File-Wrapper/Contents	N/A	99% within 7 days	
Walk-up Certification	1	99% within 1 day	
Trademark Search Library:			
Filing Drawings	21	16	
Filing Reg. Certificates	3	2	
Assignments:			
Patents	25	21	
Trademarks	25	19	
Avg. Days from Issue Fee Payment to Issue Date	90-100	90	
Patent Official Gazette:			
In Bookstore	Issue Date	On schedule	
Mailed	Issue Date	Avg. 1 day late	
Patent Grants Mailed	Issue Date	Avg. 1 day late	
Patent Copies Available	Issue Date	Avg. 3 days late	Problems being resolved.
Trademark Copies Available	Issue Date	On schedule	
Trademark Official Gazette:			
In Bookstore	Issue Date	Avg. 2 days late	Problems occurred in first 3 issues of Jan.; have been resolved.
Mailed	Issue Date	Avg. 2 days late	
Trademark Regs. Mailed	Issue Date	Avg. 4 days late	Due to new printing contractor start-up

* Includes mail processing and delivery time.

IMPROVEMENTS TO SERVICES

- *File History Orders* — On Jan. 30, 1984, an order drop off procedure was established at the Contact Representative Branch (Record Room) order desk for added convenience to customers. The procedure allows file requesters to simply fill out the request form (PTO–271) and place it in the specially marked box. The file or its location can be obtained by presenting the retained pink copy of the request form. Customers may choose to use the drop off box if they do not wish to wait while the Record Room clerks verify the location of the file through the use of computer terminals.
- *Patent Search Room* — The new chairs ordered last summer have finally arrived and have been placed in the Search Room. Additionally, our photocopier vendor has agreed to replace all photocopiers with new ones. This replacement process has begun.

REMINDER

- *Patent and Trademark Copy Orders* — It should be noted that in order to obtain copies of U.S. patents or trademark registrations through the Center, customers are required to:

1. Fill out *two* look-up slips for each number.
2. Have both slips date stamped at the Attorney's Window drop box.
3. Leave one copy at the Window for processing and keep one copy.
4. If the copy is not supplied in 3 days, bring the retained date stamped look-up slip to the Center.

The Public Service Center was not intended to be an initial ordering point for services, but will attempt to provide a service when the service has not been provided through established ordering and follow-up procedures.

Questions should be directed to:

Public Service Center
U.S. Patent and Trademark Office
CP3–2C24
Washington, D.C. 20231
(703) 557–5168

Feb. 6, 1984.

THERESA A. BRELSFORD,
Assistant Commissioner for Administration.

PATENT NOTICES

Certificates of Correction for the Week of Feb. 28, 1984

Re. 31,375	4,392,051	4,408,582	4,415,478
Re. 31,381	4,392,463	4,409,098	4,415,840
Re. 31,442	4,393,293	4,409,310	4,415,977
3,798,276	4,394,403	4,409,648	4,415,986
3,941,698	4,394,545	4,409,674	4,416,010
4,168,440	4,394,937	4,410,000	4,416,152
4,215,199	4,396,303	4,411,009	4,416,697
4,280,497	4,396,895	4,411,029	4,416,854
4,303,711	4,397,779	4,411,059	4,416,949
4,310,590	4,398,652	4,411,146	4,417,077
4,311,811	4,398,671	4,411,219	4,417,570
4,320,751	4,399,155	4,411,782	4,417,667
4,330,764	4,399,279	4,412,759	4,418,065
4,342,991	4,400,339	4,413,068	4,418,560
4,357,280	4,401,614	4,413,073	4,418,644
4,374,224	4,401,637	4,413,187	4,418,706
4,374,465	4,401,794	4,413,631	4,419,138
4,376,657	4,402,082	4,413,816	4,419,449
4,378,540	4,403,351	4,414,161	4,420,690
4,381,089	4,404,000	4,414,735	4,421,160
4,381,201	4,404,627	4,414,863	4,421,186
4,384,437	4,405,030	4,414,884	4,421,463
4,385,832	4,405,238	4,414,958	4,422,660
4,386,119	4,406,833	4,415,115	4,422,739
4,388,090	4,407,214	4,415,244	
4,389,927	4,407,427	4,415,455	

Disclaimers

4,021,224.—*Ferenc M. Pallos,* Walnut Creek; *Mervin E. Brokke,* Moraga and *Duane R. Arneklev,* Sunnyvale, Calif. HERBICIDE COMPOSITIONS. Patent dated May 3, 1977. Disclaimer filed Dec. 15, 1983, by the assignee, *Stauffer Chemical Co.*

The term of this patent subsequent to Nov. 2, 1993, has been disclaimed.

4,137,070.—*Ferenc M. Pallos,* Walnut Creek; *Mervin E. Brokke,* Moraga and *Duane R. Arneklev,* Sunnyvale, Calif. HERBICIDE COMPOSITIONS. Patent dated Jan. 30, 1979. Disclaimer filed Dec. 16, 1983, by the assignee, *Stauffer Chemical Co.*

The term of this patent subsequent to Nov. 2, 1993, has been disclaimed.

4,192,442.—*Lehyman J. Bastian,* Media, Pa., and *Richard D. Kley,* New Castle, Del. ROLL SHEET DISPENSER. Patent dated Mar. 11, 1980. Disclaimer filed Jan. 3, 1984, by the assignee, *Scott Paper Co.*

Hereby enters this disclaimer to claims 3–6 of said patent.

4,242,214.—*Clifford L. Lambert, Jr.,* Georgetown, Tex. ANTIFREEZE COMPOSITION CONTAINING A CORROSION INHIBITOR COMBINATION. Patent dated Dec. 30, 1980. Disclaimer filed Dec. 30, 1983, by the assignee, *Texaco Development Corp.*

Hereby enters this disclaimer to claims 1 through 10 of said patent.

4,258,250.—*Stephen R. Schmidt,* Chicago, Ill. JAM DETECTOR. Patent dated Mar. 24, 1981. Disclaimer filed Jan. 9, 1984, by the assignee, *Copar Corp.*

Hereby enters this disclaimer to all claims of said patent.

4,269,618.—*Ferenc M. Pallos,* Walnut Creek; *Mervin E. Brokke,* Moraga and *Duane R. Arneklev,* Sunnyvale, Calif. HERBICIDE COMPOSITIONS. Patent dated May 26, 1981. Disclaimer filed Dec. 15, 1983, by the assignee, *Stauffer Chemical Co.*

The term of this patent subsequent to Nov. 2, 1993, has been disclaimed.

4,276,078.—*Ferenc M. Pallos,* Walnut Creek; *Mervin E. Brokke,* Moraga and *Duane R. Arneklev,* Sunnyvale, Calif. HERBICIDE COMPOSITIONS. Patent dated June 30, 1981. Disclaimer filed Dec. 15, 1983, by the assignee, *Stauffer Chemical Co.*

The term of this patent subsequent to Nov. 2, 1993, has been disclaimed.

4,345,627.—*Antonio M. Cassia,* Milan, Italy SOAP DISPENSING SYSTEM. Patent dated Aug. 24, 1982. Disclaimer filed Aug. 3, 1983, by the assignee, *Steiner Corp.*

Hereby enters this disclaimer to claims 1–33 of said patent.

4,392,884.—*Ferenc M. Pallos,* Walnut Creek; *Mervin E. Brokke,* Moraga, and *Duane R. Arneklev,* Sunnyvale, Calif. HERBICIDE COMPOSITIONS. Patent dated July 12, 1983. Disclaimer filed Dec. 15, 1983, by the assignee, *Stauffer Chemical Co.*

The term of this patent subsequent to Nov. 2, 1993, has been disclaimed.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 826-4500 Ext.21
	Birmingham Public Library	(205) 254-2555
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7140
California	Los Angeles Public Library	(213) 626-7555 Ext. 273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse*	(408) 738-5580
Colorado	Denver Public Library	(303) 571-2122
Delaware	Newark: University of Delaware	(302) 738-2238
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 269-2865
	Springfield: Illinois State Library	(217) 782-5430
Indiana	Indianapolis—Marion County Public Library	(317) 269-1706
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 454-3037
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 704-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390, Ext. 391
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 930-0850
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Cambridge Springs: Alliance College Library	(814) 398-2098
	Philadelphia: Franklin Institute Library	(215) 448-1321**
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 226
South Carolina	Charleston: Medical University of South Carolina	(803) 792-2372
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
Texas	Austin: McKinney Engineering Library, University of Texas	(512) 471-1610
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 749-4176
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

All of the above-listed libraries offer CASSIS (Classification And Search Support Information System), which provides direct, on-line access to Patent and Trademark Office data.

*Collection organized by subject matter.

**Call only between the hours of 10:00 a.m. and 5:00 p.m.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF February 4, 1984

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—D. E. TALBERT, Director ..... Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	5-20-82
GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director ..... Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	7-16-73
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director .... Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthdontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	9-15-82
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director ..... Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	7-26-82
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director ..... Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	1-16-76
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—S. W. ENGLE, Director Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	1-03-82
SPECIAL LAWS ADMINISTRATION, GROUP 220—KENNETH L. CAGE, Director ..... Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy, Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.	6-01-81
INFORMATION TRANSMISSION, STORAGE, AND RETRIEVAL, GROUP 230—EARL LEVY, Director ..... Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	7-06-81
RECEPTACLES, CLEANING, WINDING, AND MEASURING, GROUP 240—G. M. FORLENZA, Director ..... Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling; Shaft; Impellers; Rotary Fluid Motors.	3-17-82
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director ..... Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	9-30-80
DESIGN, GROUP 290—KENNETH L. CAGE, Director ..... Industrial Arts; Household, Personal and Fine Arts.	1-14-71
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director ..... Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	6-04-81
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—STEPHEN G. KUNIN, Director Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	6-18-82
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. AEGERTER, Director ..... Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	11-04-76
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director ..... Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.	5-26-81
GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—A. L. SMITH, Director ..... Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Miscellaneous Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.	3-20-81

Expiration of patents: The patents within the range of numbers indicated below expire during February 1984, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,302,213 to 3,307,199, inclusive

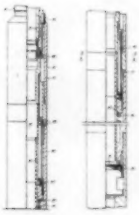
Plant Patents ..... Numbers 2,707 to 2,722 inclusive

REEXAMINATIONS

FEBRUARY 28, 1984

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 4,161,219 (169th)
PISTON ACTUATED WELL SAFETY VALVE
Ronald E. Pringle, Houston, Tex., assignor to Camco, Incorporated, Houston, Tex.
Reexamination Request No. 90/000,273, Oct. 12, 1982.
Reexamination Certificate for Patent No. 4,161,219, issued Jul. 17, 1979, Ser. No. 881,484, Feb. 27, 1978.
Int. Cl.[3] E21B *43/12*
U.S. Cl. 166—324



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claim **1** is determined to be patentable as amended:

Claims **2–5**, dependent on amended claims, are determined to be patentable.

1. In a well *tubing* safety valve for controlling the fluid flow through a well conduit and including a tubular housing *having an axial bore therethrough* and a valve closure member moving between open and closed positions *for controlling the fluid flow through the bore*, a longitudinally tubular member telescopically movable in the housing *coaxially with the bore* for controlling the movement of the valve closure member, means for biasing the tubular member in a first direction for causing the valve closure member to move to the closed position, the improvement in means for moving the tubular member in a second direction for opening the valve closure member comprising,

at least one piston telescopically movable within and having its longitudinal axis within the wall of the housing and outside of the tubular member *and offset from the bore and said valve closure member*, said piston contacting said tubular member, one side of the piston being in communication with hydraulic fluid extending to the well surface for actuating said member in the second direction to open said valve closure member, the second side of the piston being exposed to fluid pressure in the valve housing tending to move the piston in the first direction, and

said piston having *a diameter smaller than the diameter of the bore and* a cross-sectional width less than the thickness of the housing *whereby the piston has a small cross-sectional area* for reducing the hydrostatic force of the hydraulic fluid acting on the one side of the piston whereby the valve may be used at greater depths in the well.

B1 4,219,333 (170th)
CARBONATED CLEANING SOLUTION
Robert D. Harris, Sacramento, Calif., assignor to Harris Research Inc., Sacramento, Calif.
Reexamination Request No. 90/000,272, Oct. 19, 1982.
Reexamination Certificate for Patent No. 4,219,333, issued Aug. 26, 1980, Ser. No. 922,441, Jul. 3, 1978.
Int. Cl.[3] B08B *3/00*; **C11D** *3/00*
U.S. Cl. 8—137

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1–3**, **10**, **12**, **14**, and **15**, having been finally determined to be unpatentable, are cancelled.

Claims **4–9**, **11**, **13**, and **16–18** are patentable as amended:

New claims **19** and **20** are added and determined to be patentable.

19. *An effervescent, carbonated aqueous cleaning composition consisting essentially of 0.1 to 5.0 percent by weight of one or more nonionic and anionic surfactants, 0 to 1.0 percent by weight of one or more alkaline builder salts, 0 to 5.0 percent by weight of a volatile organic solvent wherein said aqueous cleaning composition is contained in a pressure vessel maintained at a gauge pressure of 1 to 10 atmospheres and wherein said aqueous cleaning composition has been uniformly carbonated by introducing gaseous carbon dioxide into said composition by means of agitation in said pressure vessel under said gauge pressure and thereafter maintaining said gauge pressure to retain said uniform carbonation.*

REISSUES

FEBRUARY 28, 1984

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

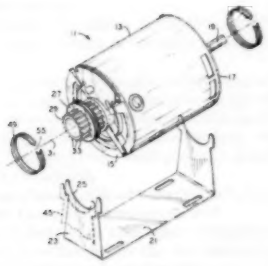
Re. 31,525
ADAPTABLE RESILIENT MOTOR MOUNTING

John H. Boyd, Jr., DeKalb, Ill., and Don C. Nelson, Jr., Fort Wayne, Ind., assignors to General Electric Company, Fort Wayne, Ind.

Original No. 4,116,410, dated Sep. 26, 1978, Ser. No. 800,418, May 25, 1977. Application for reissue Sep. 18, 1980, Ser. No. 188,526

Int. Cl.³ F16M *13/00*

U.S. Cl. 248—581 **21 Claims**



1. The method of supporting a motor having cradle engageable rings each mounted on a hub at opposite ends thereof in the arms of a selected one of a plurality of different size cradle bases comprising the steps of:

sliding at least one of the cradle engaging rings, *having a deviation from a circular configuration generally mating with respect to its associated motor hub and being substantially less in axial dimension than the associated motor hub,* axially along the *associated* motor hub until the separation between the rings is appropriate for positioning the motor adjacent the selected base with the rings in registry with corresponding base arms;

engaging the base arms with the corresponding rings; and

securing the rings to the base.

Re. 31,526
COATED CEMENTED CARBIDE BODY AND METHOD OF MAKING SUCH A BODY

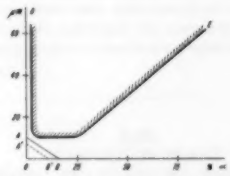
Ulf K. H. Smith, Huddinge; Jan N. Lindstrom, Norsborg, both of Sweden, and Harold Mantle, Hauterive, Switzerland, assignors to Santrade Ltd., Lucerne, Switzerland

Original No. 4,180,400, dated Dec. 25, 1979, Ser. No. 913,035, Jun. 6, 1978. Application for reissue Dec. 16, 1981, Ser. No. 331,314

Claims priority, application Sweden, Jun. 9, 1977, 7706706

Int. Cl.³ B22F *5/00*

U.S. Cl. 75—235 **28 Claims**



1. Sintered cemented carbide body containing at least one metal carbide and a binder metal, on which body there is applied at least one thin, wear resistant surface layer consisting essentially of aluminum oxide, characterized in that at least 85% of the aluminum oxide consists of the kappa form, the remainder if any, which mainly constitutes the alpha form, being formed as surface portions or spots having a size of at the most 10 μm[, the size and the occurrence of the surface portions being so adjusted that they lie within the area AOB in FIG. 1 of the attached drawing].

PLANT PATENTS

GRANTED FEBRUARY 28, 1984

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,195

LEUCOTHOE PLANT-ZEBLID VARIETY

Alex J. Zebehazy, Perry, Ohio, assignor to The Conard-Pyle Company, West Grove, Pa.

Filed Jun. 23, 1980, Ser. No. 161,870
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—54 **1 Claim**

1. A new and distinct variety of Leucothoe, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of:

(a) a dense, compact, and symmetrical habit of growth which is much more attractive and compact than the *Leucothoe fontanesiana* parent,

(b) striking scarlet coloration of the new growth during the growing season, which is virtually never found in either parent,

(c) highly unique winter coloration which ranges from a greenish bronze to scarlet, making the new variety an outstanding source of color in the landscape throughout the year,

(d) outstanding tolerance to shade, making the variety an important addition to that small group of plants that do well in diminished sunlight,

(e) substantial absence of dead branches, which are commonly found with *Leucothoe fontanesiana*, and

(f) increased tolerance to cold when compared to *Leucothoe axillaris*, as is evidenced by the fact that the variety when established has survived temperatures of −15° F. with little to no damage, whereas *Leucothoe axillaris* is listed as hardy to 0° F.

5,196

LILY NAMED FRESCO

Ted T. Kirsch, Myrtle Point, Oreg., assignor to Sun Valley Bulb Farms, Inc., Myrtle Point, Oreg.

Filed Sep. 23, 1982, Ser. No. 422,200
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct Oriental hybrid lily cultivar substantially as herein shown and described, characterized by its medium pink outwardly facing flowers, the petals of which have a prominent narrow yellow-orange stripe along the midrib and numerous maroon spots; and the petal tips are slightly recurved, the flowers are borne on short stiff outwardly projecting pedicels and are long lasting whether on the plant or as a cut flower, and the foliage is dark glossy green and relatively abundant.

5,197

LILY NAMED FREEDOM

Ted T. Kirsch, Myrtle Point, Oreg., assignor to Sun Valley Bulb Farms, Inc., Myrtle Point, Oreg.

Filed Sep. 23, 1982, Ser. No. 422,202
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct variety of Oriental Hybrid lily plant substantially as herein shown and described, characterized by its large, white, downwardly and outwardly facing saucer-shaped flowers borne on strong, stiff, outwardly projecting pedicels, by petals that are lightly covered with maroon and white spots and have their outer one third portions recurved, by the glossy green and relatively disease-free foliage, and by the long lasting quality of the blooms whether on the plant or as cut flowers.

5,198

CARNATION PLANT

Leonard E. Carrier, 1911 Sheridan Rd., Encinitas, Calif. 92024

Filed Sep. 30, 1982, Ser. No. 431,834
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—73 **1 Claim**

1. A new and distinct cultivar of carnation plant named Big Red substantially as herein shown and described, characterized particularly as to novelty by the unique combination of a very vigorous and free-breaking plant habit, and strong and straight stems; superior resistance to soil-borne diseases such as Fusarium oxysporium and Fusarium roseum and other root-rots such as damping off, water molds, and the like; large serrated flowers which open fully without bursting the calyx and causing "splits"; a distinctive and attractive red flower color which does not fade and has no white streaks; and good heat tolerance which is superior to that of the parent lines and the so-called "Sim".

PATENTS

GRANTED FEB. 28, 1984

ERRATA

For CLASS	See PATENT NO.
052–169	4,433,720
435–007	4,433,956
433–105	4,433,957
433–199	4,433,958
433–201	4,433,959
433–215	4,433,960
434–274	4,433,961
445–006	4,433,962
474–080	4,433,963
474–152	4,433,964
474–201	4,433,965
502–022	4,434,079
502–152	4,434,080
502–154	4,434,081
502–164	4,434,082
502–154	4,434,083
381–104	4,434,325

PATENTS

GRANTED FEBRUARY 28, 1984

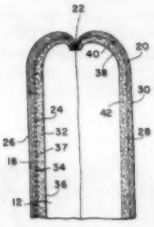
GENERAL AND MECHANICAL

4,433,439

HEAT RESISTANT PROTECTIVE HAND COVERING

Kenneth R. Sidman, Wayland, and Irving J. Arons, Peabody, all of Mass., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C. and Richard P. Tschirch, Westwood

Filed Jun. 30, 1982, Ser. No. 393,581
Int. Cl.³ A41D *19/00*
U.S. Cl. 2—161 R **11 Claims**



1. A heat-resistant protective glove comprising:
a first shell section generally defining the palm side of said glove and having inner and outer surfaces, said first shell section comprising a twill weave fabric of a temperature-resistant aromatic polyamide fiber;
a second shell section generally defining the backside of said glove and having inner and outer surfaces, said second shell section comprising a knitted fabric of a temperature-resistant aromatic polyamide fiber, said first and second shell sections being secured to one another so as to provide an opening for insertion of a wearer's hand;
a first liner section secured to said first shell section and having first and second surfaces, said first surface of said first liner section facing and generally overlying said inner surface of said first shell section, said first liner section comprising a felt fabric of a temperature-resistant aromatic polyamide fiber having a flame resistant, elastomeric coating on said first liner surface; and
a second liner section secured to said second shell section and having first and second surfaces, said first surface of said second liner section facing and generally overlying said inner surface of said second shell section, said second liner section comprising a felt fabric of a temperature-resistant aromatic polyamide fiber.

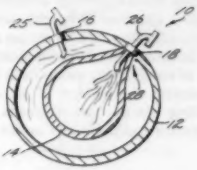
4,433,440

PROSTHESIS FORMED BY INNER AND OUTER INFLATABLE CONTAINERS

I. Kelman Cohen, 5104 Cary St. Rd., Richmond, Va. 23226

Filed Feb. 26, 1979, Ser. No. 15,436
Int. Cl.³ A61F *1/24;* A41C *3/10*
U.S. Cl. 3—36 **6 Claims**

1. A breast prosthesis comprising
an outer inflatable container of flexible biological implant material;
an inner inflatable container of flexible biological implant material, substantially concentric with said outer container;
a valve associated with each container and for admitting fluid to the container with which it is associated, and for sealing the fluid within the container after filling thereof;
removable fluid-filling means for penetrating said valves and providing the introduction of fluid therethrough; and
wherein both valves are self-sealing and wherein said removable fluid-filling means comprises a single tubular member penetrating both self-sealing valves at the same time, and means mounting said tubular member for movement from a position penetrating both self-sealing valves to a position penetrating only the self-sealing valve of said outer container, to a position penetrating neither valve.

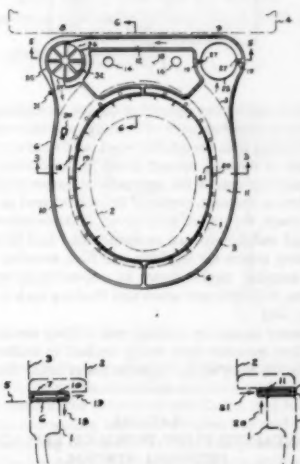


4,433,441

WATER CLOSET-ODOR NEUTRALIZER

Warren C. Schroeder, Gellett Suite C-603 2400 Virginia Ave. NW., Washington, D.C. 20037

Filed Dec. 30, 1981, Ser. No. 335,846
Int. Cl.³ E03D *9/04;* A47K *13/00*
U.S. Cl. 4—213 **6 Claims**



1. In combination with a toilet unit having a water closet bowl, a seat pivotally connected thereto, a water closet tank having a cover therefor and a discharge conduit means including a trap communicating with said water closet bowl at one end and adapted for connection to a sewage pipe at the opposite end, a chemically aided water closet odor neutralizing device comprising an air chamber means mounted on top of the water closet bowl rim positioned between said seat and said bowl, said air chamber means having a pressure cavity on one end of said water closet bowl and having a plurality of holes

spaced around the interior thereof to discharge a blanket of air across the upper portion of said water closet bowl opening, a suction cavity on the other side of said water closet bowl opening opposite said pressure cavity and having a plurality of holes spaced around the interior thereof receiving the blanket of air discharged from the for pressure cavity, said blanket of air passing through said suction cavity, said suction cavity means whereby the air passing threthrough passes through a chemically saturated filter, said filter having means to supply it with liquid chemicals from a canister attached thereto, means providing a suction chamber whereby said air is passed through said chamber by way of port means and into a motorized fan having a housing therefor, said motorized fan directing the air by way of second port means back into said pressure cavity for recirculating the blanket of air across said bowl opening for recycling; electric switch means within said pressure cavity for activating said fan and motor therefor.

4,433,442

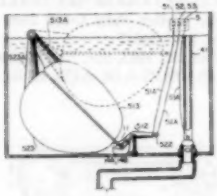
TOILET SEAT AND COVER OPERATING DEVICE

Shu L. Liou, 2 Fl., No. 33, La. 52, Szu Wei Rd., Taipei, Taiwan

Continuation-in-part of Ser. No. 192,182, Sep. 30, 1980, abandoned. This application Apr. 12, 1982, Ser. No. 367,253

Int. Cl.³ A47K *13/10*

U.S. Cl. 4—251 **13 Claims**



1. A toilet seat/cover operating device, comprising:

(a) a float member capable of floating on water and installed in a flushing tank for a toilet bowl, said float member being capable of moving up and down in the flushing tank;

(b) connecting means for operatively connecting said float member to the seat/cover of the toilet bowl so as to raise and lower the toilet seat/cover in association with the upward and downward movements of said float member;

(c) holding means for latching said float member when said float member moves down to a lowermost position and holding it submerged when said flushing tank is filled with water; and

(d) releasing means for causing said holding means to release said float member from being latched to enable said float member to buoy up through the water in the flushing tank.

4,433,443

SELF-CONTAINED FLOW THROUGH SEWAGE WASTE DISPOSAL SYSTEM

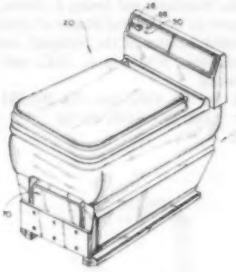
Kenneth J. DeGraw, Montvale; Brian Wilcockson, Wayne; Earl W. Nickerson, Ocean City; William R. Bocchini, Wyckoff; Armen Bogossian, Teaneck, and Steve Proios, Northvale, all of N.J., assignors to American Standard Inc., New York, N.Y.

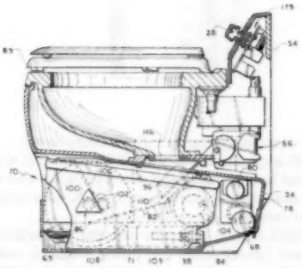
Filed Nov. 12, 1981, Ser. No. 320,599

Int. Cl.³ E03D *5/019*

U.S. Cl. 4—317 **12 Claims**

1. A self-contained sewage disposal system comprising; a housing structure, a toilet bowl adapted to receive human waste and fluid for diluting the waste, transporting the waste and rinsing the bowl, a removable filter cassette in the housing in communication with the toilet bowl, means for flushing the bowl and dumping the contents into the filter cassette and for subsequent refilling of the bowl, filter means in the cassette for separating the particles of solid material from the fluid received from the bowl, storage means in the cassette to store the solid material in a compact manner for subsequent disposal upon removal of the cassette, pump means including interconnected conduits in the housing to transport fluid directly from an external source to fill the bowl after a flush, to transport and recirculate filtered fluid through the system for further waste





disposal treatment and to direct the effluent fluid from the system thereafter, and control means to pass the fluid through the system to facilitate the collection and disposal of sewage waste within the system in a predetermined sequence.

4,433,444

TOILET WITH MECHANICAL DRAINAGE COMPRISING A DRAINING CHAMBER ACCESSIBLE AND DISMOUNTABLE FROM INSIDE THE TOILET BOWL

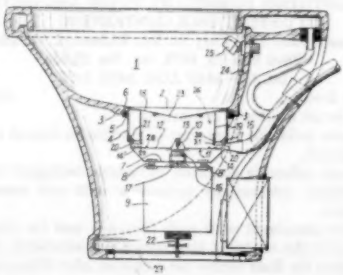
Claude Ragot, Place du 11 Novembre, 56500 - Locmine, France

Filed Apr. 29, 1982, Ser. No. 373,140

Claims priority, application France, May 8, 1981, 81 09212

Int. Cl.³ E03D *9/10*

U.S. Cl. 4—319 **9 Claims**



1. A toilet of the type comprising a bowl supplied with water

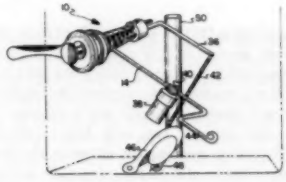
and of which the bottom part communicates via a passage with a lower chamber provided with means for crushing and draining faeces towards a downstream draining conduit, wherein the crushing and draining means is removably fastened within said lower chamber and said passage is so shaped and dimensioned so that the crushing and draining means can be removed from the lower chamber through said passage, thus giving access to said crushing and draining means from bottom of the bowl and permitting removing and re-assembling of said crushing and draining means through the bowl.

4,433,445

DUAL FLUSH TOILET MECHANISM

George R. Morris, 3760 N. Vista, NW., and John A. Frient, 3785 N. Vista, NW., both of Uniontown, Ohio 44685

Filed Oct. 1, 1981, Ser. No. 307,373
Int. Cl.³ E03D *3/12*
U.S. Cl. 4—325 **11 Claims**



1. A half-flush mechanism for a commode, comprising:
an angled half-flush rod having first and second legs extending from an apex;
a float attached to said first leg of said angled rod which leg is located within the commode tank;
a flush handle external of said tank, through which is slidably mounted said second leg of said angled rod;
a push button located at the end of said second leg;
a compression spring applying a force to said angled rod at its apex;
a mechanism housing surrounding said spring and at least a portion of said second leg of said angled rod;
a stationary mount which prevents operation of said half-flush mechanism during operation of said flush handle;
a housing end piece which fits over said mechanism housing;
a flush lever attached to said housing end piece; and
means for securing said mechanism to the commode tank wall.

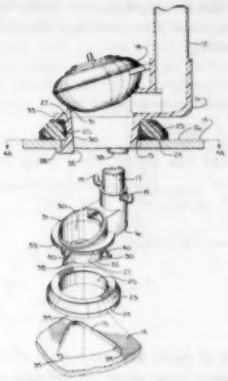
4,433,446

FLUSH VALVE ATTACHMENT SYSTEM

Ronald N. Grimstad, Sheboygan, Wis., assignor to Kohler Co., Kohler, Wis.

Filed Jan. 27, 1983, Ser. No. 461,437
Int. Cl.³ E03D *1/34*
U.S. Cl. 4—378 **9 Claims**

1. A flush valve attachment system for connecting a flush valve to a wall of a toilet tank, comprising:
a non-circular outlet formed in the wall of the tank;
a resilient seal bearing against an interior side of the wall, the seal surrounding the outlet and having a central bore aligned therewith;
a flush valve having a housing that extends through the seal bore and outlet, said housing having a radially outwardly extending flange inward of the seal to trap the seal against the wall and a radially outwardly extending projection on the exterior side of the wall; and
said housing being rotatable between a first position in which the projection can pass through the outlet, and a



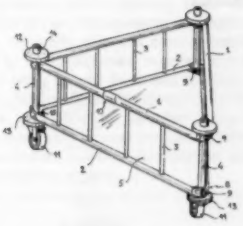
second position where the projection can catch on the exterior side of the wall.

4,433,447

PLAY PEN

Marcel Mathou, 12630, Gages, France

Filed May 3, 1982, Ser. No. 374,024
Claims priority, application France, May 6, 1981, 81 09041
Int. Cl.³ E03D *11/10*
U.S. Cl. 5—93 R **9 Claims**



1. A play pen including a peripheric frame formed of corner posts and side-members extending between said corner posts, wheels mounted at the bottom of said frame, and hollow flexible elements connecting said side-members to said posts, each of said connecting elements having end portions fitted on adjacent side-members and a medium portion secured to one of said posts by securing means flattening said medium portion against said post.

4,433,448

POWER PIPE THREAD CLEANER

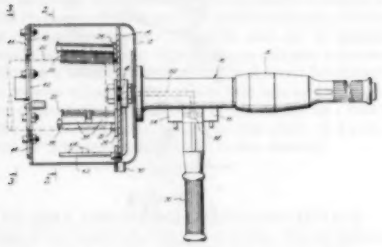
Martin E. True, Houston, Tex., assignor to Weatherford/Lamb, Inc., Houston, Tex.

Filed Sep. 16, 1982, Ser. No. 419,119
Int. Cl.³ B08B *9/02*
U.S. Cl. 15—88 **8 Claims**

1. A cleaner for cleaning the threads on the ends of a tubular member comprising,
a housing,
a rotatable disc in the housing,
power means connected to the disc for rotating said disc,
a plurality of cleaning brushes,
a plurality of brush adjusting arms, each of which supports a

cleaning brush, pivotally connected to the disc, a releasable connection between the adjusting arms and the disc whereby the arms may be rotated on the disc for moving the brushes for coacting with different sized members,

said housing having an opening at one end and a flange about said opening,



a plurality of guide adjusting arms pivotally connected to the housing flange about the opening, a releasable connection between the guide adjusting arms and the housing flange whereby the guide arms may be rotated on the housing flange for guiding and aligning different sized members into the opening.

4,433,449

CHIMNEY CLEANER

Amon E. Rainey, 19765 SW. Hazelhurst, West Linn, Oreg. 97068

Filed Aug. 16, 1982, Ser. No. 408,530
Int. Cl.³ F23J *3/00*
U.S. Cl. 15—243 **5 Claims**

1. A chimney cleaner comprising

(a) a link chain having top and bottom ends and arranged to hang down in a chimney,

(b) the adjacent links of said chain having flattened lateral engaging portions whereby to produce a rotative drive connection from one link to the next,

(c) lateral fingers secured on said link chain arranged upon rotation of said link chain to knock off substance which has collected on the inner surface of the chimney,

(d) each of said lateral fingers comprising a stiff piece of wire connected to spaced links of said chain and extending laterally in opposite directions,

(e) a weight on the bottom end of said link chain arranged to hold the latter substantially plumb in a chimney,

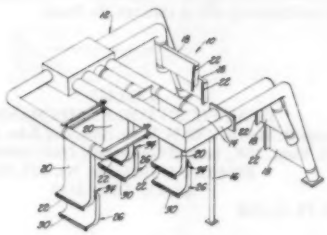
(f) and a spindle on the top end of said link chain arranged for connection to a drive mechanism for rotating said link chain and lateral fingers.

4,433,450

SECONDARY BAG ADJUSTMENT

Lucian G. McElroy, 3315 Brocker Rd., Metamora, Mich. 48455, and David R. Day, 4334 Ocean Dr., Apt. 203, Corpus Christi, Tex. 78412

Filed May 17, 1982, Ser. No. 378,957
Int. Cl.³ F26B *19/00*
U.S. Cl. 15—316 R **8 Claims**



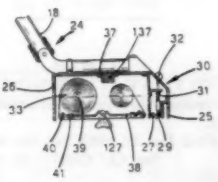
1. An apparatus (10) for stripping fluid from the surface of an object, said apparatus (10) comprising: a flexible inflatable primary bag (20) including a primary bag inlet and a nozzle end (22) and a bag opening (24) disposed therebetween; a plenum (14) having a chamber therein and a plenum opening therethrough, said primary bag inlet being releasably mounted about said plenum opening for allowing the flow of air from said plenum (14) to said primary bag (20); a flexible inflatable secondary bag (26) having an elongated secondary bag inlet (28) secured about said bag opening (24) for hinging movement and a nozzle end (30) for allowing the flow of air therethrough; and characterized by hinging control means (34) for controlling the hinging action of said secondary bag (26) with respect to said primary bag (20).

4,433,451

DEVICE FOR CLEANING SURFACES

Sebastiano Parisi, Rome, Italy, assignor to NOVUM - Novita in Elettrodomestica Srl, Trieste, Italy

Filed Jan. 2, 1981, Ser. No. 222,261
Claims priority, application Italy, Jan. 14, 1980, 83306 A/80
Int. Cl.³ A47L *11/30*
U.S. Cl. 15—321 **8 Claims**



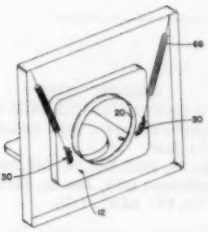
1. A device for cleaning surfaces comprising a cleaning head having a front and back composed of means to suck up material from said surfaces, means to moisten said surfaces, means to brush said surfaces, and means to absorb dust and wipe clean said surfaces positioned between said moistening means and said surfaces and interacting with said moistening means; a basic unit composed of a suction fan, steam generator and means to control said suction and moistening means and means interconnecting said cleaning head and basic unit.

4,433,452

SELF RETAINED PLASTIC CABLE GUIDE AND DOOR STOP

Francis G. Frano, 1925 Brookside La., Hoffman Estates, Ill. 60194

Filed Dec. 28, 1981, Ser. No. 334,625
Int. Cl.³ B65D 55/00; E05F 5/02
U.S. Cl. 16—2 14 Claims



1. The combination of a cable-like member and a one-piece cable guide and door stop which is mounted in an aperture of a workpiece, said cable-like member having an enlarged end on one end thereof with a force inducing means reacting to place a tensile stress on said member through said enlarged end and having means on its other end for connecting to a movable member, said one-piece cable guide and door stop comprising enlarged apertured head means, channel means integral with said head means which extends coaxially therefrom and angularly relative thereto, said one-piece cable guide and door stop having means for engaging said workpiece on a surface opposite the surface engaged by said head means, said head means and said channel means having a generally inverted U-shaped cross section and having an opening through adjacent edges thereof to permit entry of said cable-like member, said channel means being slotted at a point diametrically opposite said adjacent edges to provide a resilient shouldered tab spaced from said head means for engaging said workpiece, and means located on said channel means for cooperation with said enlarged end to at least temporarily overcome said tensile stress in said cable-like member.

4,433,453

SHOULDER SKINNING DEVICE

Lyndon R. Leining, and Kent L. Simonson, both of Austin, Minn., assignors to Geo. A. Hormel & Company, Austin, Minn.

Filed Apr. 21, 1982, Ser. No. 370,569
Int. Cl.³ A22B 5/16
U.S. Cl. 17—21 8 Claims

1. A skinning apparatus for removing skin from the shoulder area of a hog carcass, comprising:

a skinning device including a generally vertically oriented housing having a hollow interior,

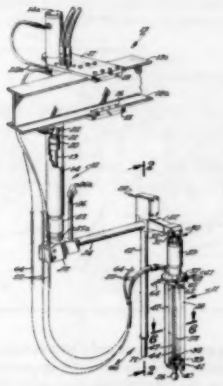
an elongate vertically oriented toothed roller revolvably mounted therein said housing for revolving movement relative thereto,

an elongate generally vertically oriented skinning blade having a cutting edge, means mounting said blade on said housing to position the cutting edge of the blade closely adjacent the toothed roller, said blade and toothed roller each having a length dimension corresponding generally to the length dimension of the shoulder area of a hog whereby said toothed roller will grip the skin of the hog carcass and pull the same against the cutting edge of the blade to remove the skin from the shoulder of the hog carcass in a single pass,

power means secured to said housing at the upper end thereof and being operable for selectively revolving said toothed roller in a clockwise and counterclockwise direction,

a suspension device including a stationary support, an elongate vertically disposed suspension member, second power means connected with said stationary support, means connecting said second power means with the upper end of said suspension member to permit rotation of the suspension member about its longitudinal axis and vertical translation of the suspension member relative to said support,

an elongate horizontal member secured to said suspension member at the lower end thereof and being movable



therewith, means interconnecting said horizontal member with said first-mentioned power means to permit angular tilting of the skinning device housing about a horizontal axis and rotation of the housing about its longitudinal axis,

and an elongate vertically disposed control handle mechanism secured to said horizontal member and depending therefrom and being spaced from said housing, said control handle mechanism including elongate fixed and movable members, said movable member being vertically shiftable to actuate said second-mentioned power means and being revolvable in either direction to actuate said first-mentioned power means.

4,433,454

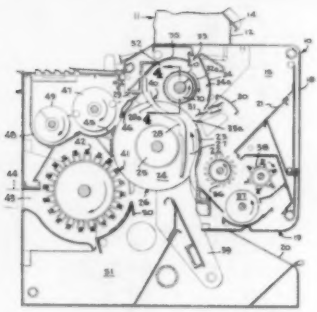
SAW TYPE GIN STAND WITH SEED REMOVAL TUBE

Joe E. Salmon, Birmingham; Fleetwood E. Strother, and James R. Crawford, both of Prattville, all of Ala., assignors to Allied Products Corporation, Chicago, Ill.

Continuation of Ser. No. 68,101, Aug. 20, 1979, abandoned. This application Aug. 17, 1981, Ser. No. 293,091
Int. Cl.³ D01B 1/08
U.S. Cl. 19—55 R 14 Claims

1. A saw type cotton gin and auxiliary seed discharge means designed to have high capacity through continuous removal of ginned seed axially from the interior portion of the seed roll during ginning concurrently with gravity discharge of ginned seeds from the seed roll periphery, comprising a gin stand casing having ginning ribs and hulling ribs therein spaced from the ginning ribs and a saw cylinder having saws rotating about a saw cylinder axis and extending through said ribs, means defining a roll box located generally above the intervening zone between the ginning and hulling ribs having an entrance at the top of said intervening zone to receive seed cotton carried through the hulling ribs and upwardly into the roll box to join cotton in the seed roll and be presented to ginning points between said ginning ribs, the saws including toothed edge portions extending into the roll box and said seed roll being rotated thereby about an axis paralleling the saw cylinder axis, a gravity seed discharge from the roll box through

said intervening zone, a rotatable perforated seed removal tube located in the roll box at the interior portion of the seed roll near the axis of rotation of the seed roll paralleling said axis and spanning the width of the roll box and gin stand casing, the tube having many perforations through the tube wall thereof sized to pass ginned seeds therethrough into its interior while preventing passage of unginned seeds, means for continuously rotating said seed removal tube about its axis in direction corresponding to the direction of seed roll rotation and at a surface speed significantly exceeding the speed imparted to the immediately confronting seed roll portions by the saws, said tube including a plurality of shallow protrusions extending outwardly from the outer surface of the tube immediately



adjacent trailing edge portions only of a predetermined portion of the perforations therein to enhance imparting of rotation to the seed roll from the tube, screw conveyor means within said tube spanning its length and means for rotating the screw conveyor means to convey the ginned seeds passing into the tube through its perforations outwardly through end portions of the tube to external seed receiving means whereby a significant proportion of ginned seeds are removed from the interior of the seed roll greatly diminishing the proportion of ginned seed gravity discharge through said intervening zone and thereby significantly diminishing counterflow resistance to transport of unginned seeds upwardly through said zone and into the roll box.

4,433,455

CLEANING WASTE FROM BENEATH MACHINERY

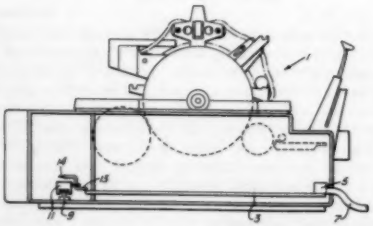
George E. Griffiths, 19 Yew Tree Ave., Northowram;Halifax, West Yorkshire, England

Filed Nov. 20, 1981, Ser. No. 323,229

Claims priority, application United Kingdom, Nov. 27, 1980, 8038151

Int. Cl.³ D01G *15/82*

U.S. Cl. 19—107 **4 Claims**



1. Apparatus for removing waste from below machinery, the apparatus comprising one or more receiving members substantially covering the area beneath the machinery, suction means extending across the full width of the receiving members adjacent to one end thereof, guide means positioned adjacent to the other end of the receiving members and extending the full width thereof, a traveller mounted for movement along the guide means and carrying at least one nozzle directed towards the receiving members, means for reciprocating the traveller along the guide means and means for supplying compressed air to the or each nozzle during such movement.

4,433,456

CLOSURE DEVICE PARTICULARLY FOR SKI BOOTS

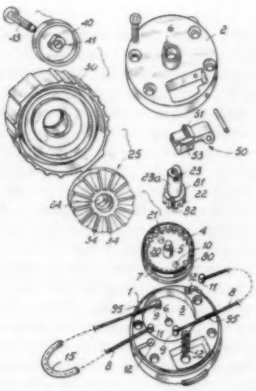
Giorgio Baggio, S. Martino di Lupari, Italy, assignor to Nordica S.p.A., Montebelluna, Italy

Filed Jan. 18, 1982, Ser. No. 340,549

Claims priority, application Italy, Jan. 28, 1981, 19383 A/81

Int. Cl.³ A43C *11/00*

U.S. Cl. 24—68 SK **6 Claims**

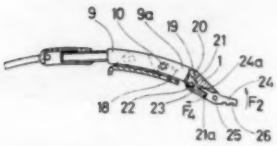


1. A closure device particularly for ski boots, comprising a box-like body fixable to a boot portion, a spool rotatably arranged within said box-like body, at least one cable having one end secured to said spool for being wound thereon and unwound therefrom, said at least one cable engaging another boot portion outwardly of said box-like body for selectively tightening and loosening said another boot portion with respect to said boot portion, a knob externally of said box-like body and rotatable with respect thereto for operation of said spool, ratchet means for locking said spool upon rotation of said knob in one direction and releasing said spool upon rotation of said knob in an opposite direction, said ratchet means comprising a ratchet member having a ratchet serration and a sleeve portion rigid therewith and coaxial with said knob, and a pawl selectively engageable with, and disengageable from, said ratchet serration, wherein said ratchet member is axially undisplaceable with respect to said spool but rotatively connected therewith and has a thread formation on said sleeve portion, and wherein said knob has a threading matching with said thread formation on said sleeve portion and a projection for operation of said pawl, said knob being threadable on said sleeve portion into a position rigid with said ratchet member for rotation of said spool in a cable winding direction, and unthreadable on said sleeve portion into a position in which said projection disengages said pawl from said ratchet serration and said knob is rigid with said ratchet member for rotation of said knob in said opposite direction to cause unwinding of said at least one cable from said spool.

4,433,457
BUCKLE, NOTABLY FOR SKI BOOTS

Edward L. Chalmers, II, and David C. Everest, III, both of Boulder, Colo., assignors to Lange International S.A., Fribourg, Switzerland

Filed May 4, 1982, Ser. No. 374,650
Int. Cl.³ A43C *11/00*
U.S. Cl. 24—68 SK 11 Claims



1. A device for closing two opposed closure flaps of a sports footwear, notably a ski boot, which comprises:

a fastening element adapted to be secured to one of the closure flaps,

a coupling member for interconnecting said two flaps,

means for connecting said coupling member with said fastening element,

a latch lever pivotally connected at one end to a support adapted to be secured to the other of said closure flaps,

means pivotally connecting said coupling member with said latch lever, said coupling member having an integral extension which extends beyond the pivotal connection of said coupling member with said latch lever substantially in co-planar relation and within the thickness of said latch lever when said latch lever is pivoted to its closed position adjacent said other flap,

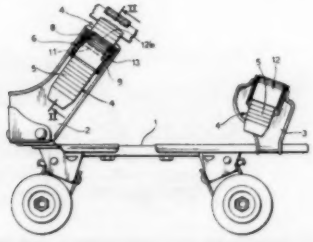
cooperating means on said extension and said latch lever for locking said extension and latch lever in closed position, and

means for releasing said locking means.

4,433,458
QUICK-FASTENER FOR ROLLER SKATES

Icaro Olivieri, Montebelluna, Italy, assignor to Icaro Olivieri & C. S.p.A., Montebelluna, Italy

Filed Jun. 11, 1981, Ser. No. 272,724
Int. Cl.³ A44B *11/00*
U.S. Cl. 24—191 6 Claims



1. A quick fastener for a roller skate comprising:

a band adapted to be affixed to the roller skate;

said band being provided on one face with transverse saw-teeth;

a substantially U-shaped rigid support member adapted to be affixed to one side of the roller skate in operative relationship relative to the band; and

a spring pawl being outwardly exposed and operatively affixed to the substantially U-shaped support and including an active end biased toward the substantially U-shaped support for engaging the transverse saw-teeth of said band;

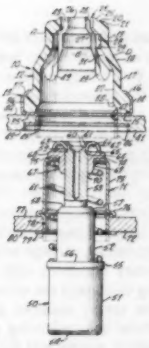
said spring pawl further including a knurled part displaceable relative to said active part and being manually engageable for displacing said active part away from said substantially U-shaped support;

wherein when said band is disposed between the substantially U-shaped support and the spring pawl said active end automatically engages the transverse saw-teeth and said band is lockingly engaged relative to said U-shaped support and upon manually biasing said active end of said spring pawl away from said substantially U-shaped support said active end disengages from said band to permit the release of said band from said substantially U-shaped support.

4,433,459
HIGH STRENGTH PUSH TYPE FASTENER

Jorge W. Molina, Torrance, Calif., assignor to Deutsch Fastener Corp., El Segundo, Calif.

Filed May 24, 1982, Ser. No. 381,553
Int. Cl.³ F16B *19/00*; A44B *17/00*
U.S. Cl. 24—613 18 Claims



1. A fastener comprising:

a housing member attached to a first workpiece,

a plunger reciprocative relative to said housing member, said plunger including a first shoulder means at one end thereof and a second shoulder means inwardly of said one end,

a receptacle means, said receptacle means including

a plastic member having a base portion, and a plurality of integral leaf springs projecting in one direction from said base portion,

and a metal member for securing said plastic member to a second workpiece,

said leaf springs having outer end portions engaged by said first shoulder means of said plunger,

resilient means biasing said plunger in a direction such that said first shoulder means is held in engagement with said end portions of said leaf springs,

said leaf springs including abutments extending outwardly from said end portions thereof, said first shoulder means including a portion radially outwardly of said abutments for providing a mechanical lock to resist outward deflection of said leaf springs,

and a release member on said plunger intermediate said first and second shoulder means,

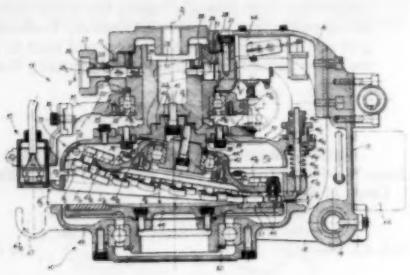
said release member being movable by said second shoulder means upon movement of said plunger in opposition to said resilient means for prying apart said leaf springs for releasing said first shoulder means from said end portions of said leaf springs.

4,433,460

APPARATUS FOR SPREADING AND GUIDING A WEB OF TEXTILE FABRIC

Mitsuru Kuroda, 16, Momoyama Mizuno Sakon Higashimachi, Fushimi-ku, Japan

Filed Apr. 20, 1981, Ser. No. 255,748
Claims priority, application Japan, Apr. 23, 1980, 55-54761
Int. Cl.³ D06C *3/06*
U.S. Cl. 26—75 **10 Claims**



1. A device for use on one edge of an apparatus for spreading and guiding a web of textile fabric and the like flexible material, comprising: a first rotary member having a surface; first supporting means for supporting said first member rotatably about a first axis; a second rotary member provided at the periphery thereof with a plurality of pushing members and means for resiliently projecting said pushing members from the surface of said periphery; second supporting means for supporting said second rotary member rotatably about a second axis tilted a predetermined angle relative to said first axis and in generally opposed relation to said surface of said first rotary member, thereby to hold a selvage of said web between said first and second rotary members, with said pushing members successively coming to engage the selvage of said web on said surface of said first rotary member at a nipping point and disengaging therefrom at a releasing point as said first and second rotary members are rotated by friction with said web being fed; means for detecting displacement of said web from a predetermined direction; and means operable in response to said detecting means for turning said second supporting means about said first axis and simultaneously displacing said second supporting means axially of said first axis, thereby to nutate said second rotary member about said first axis and simultaneously move said second rotary member axially of said first axis relative to said first rotary member so as to change said nipping point while keeping said releasing point substantially unchanged.

4,433,461

METHOD OF MANUFACTURING AN ACOUSTIC SPHERICAL LENS

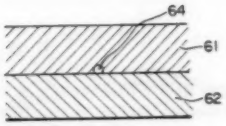
Isao Ishikawa, Hino; Hiroshi Kanda, Tokorozawa, and Toshio Kondo, Kunitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 145,146, Apr. 30, 1980, Pat. No. 4,384,231. This application Dec. 8, 1982, Ser. No. 448,035
Claims priority, application Japan, May 11, 1979, 54-57096; Jun. 25, 1979, 54-79209
Int. Cl.³ H01L *41/22*
U.S. Cl. 29—25.35 **6 Claims**

1. A method of manufacturing an acoustic spherical lens including a solid acoustic energy propagating member having a transducer means on one side of said propagating member, comprising the steps of:

(a) stacking onto one another a first member made of a solid acoustic energy propagating medium and a second member made of a material, the melting point of which is equal to or greater than that of said first member;

(b) heating the stacked structure to a temperature near a melting point of said first member so as to form a bubble in a contact interface between said first member and said second member said bubble having a concave spherical surface in said first member,



(c) polishing said stacked structure from the second member side so that the concave spherical surface of said first member is exposed, and

(d) providing a piezoelectric transducer on an end face of said first member opposite to said concave spherical surface of said first member.

4,433,462

APPARATUS FOR MANIPULATING SNAP RINGS

Stratton, Thomas A., 1600 N. Mirror, Amarillo, Tex. 79107

Filed Nov. 16, 1981, Ser. No. 322,024
Int. Cl.³ B23P *19/04*
U.S. Cl. 29—229 **3 Claims**

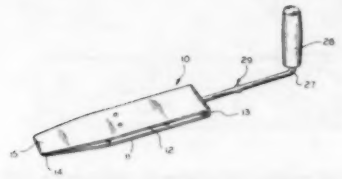
1. A transmission tool comprising a rigid straight handle firmly attached substantially at right angles to a rigid straight shaft, and a blade assembly, said blade assembly being a rigid flat plate which is firmly attached to the end of the shaft distant from the handle and comprises a tooth next to a blade end, which blade end extends from a straight rear blade edge to a front blade edge, said front blade edge having a recess, said plate assembly plate also comprising a flat right side blade face and a flat left side blade face, said recess having an outwardly concave handle end and an outwardly concave peripheral portion adjacent said tooth and a central recess face position.

4,433,463

MULTIPURPOSE PRYING TOOL

Alvin J. DuVal, Waukesha, Wis., assignor to William Diedrich, Waukesha, Wis., a part interest

Filed Sep. 13, 1982, Ser. No. 417,714
Int. Cl.³ B23P *19/04*
U.S. Cl. 29—239 8 Claims



1. A tool for prying objects apart, comprising:

a strip of resilient flexible material formed as a wedge comprised of a rear portion corresponding to the thick end of the wedge and two flexible jaw portions forming the sides of the wedge and extending longitudinally and integrally from said rear portion and converging continuously from said rear portion so the free ends contact to form the thin edge of the wedge,

a shaft passing slidably and rotationally through said rear portion for extending between said rear portion for extending between said jaw portions and an eccentric element rotatable with the shaft between said jaw portions,

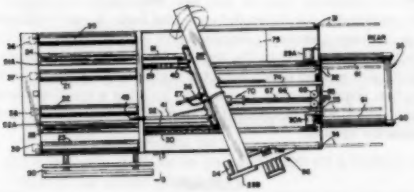
said eccentric element having a rotational position where it exerts no force on said sides for allowing the free ends of said jaws to contact under the influence of the resilience of said sides for facilitating insertion of the thin end of the wedge between objects that are to be parted by applying a driving force to the thick end of the wedge and said eccentric element being rotatable by means of said shaft to other positions wherein it forces said jaw portions to separate to cause parting of the objects.

4,433,464

APPARATUS FOR RECLAIMING NAILED BOARDS FROM A BOARD ROAD

Francis A. Hebert, Schriever, La., assignor to South Louisiana Contractors, Lafayette, La.

Filed Aug. 28, 1981, Ser. No. 297,102
Int. Cl.³ B23P *19/04*
U.S. Cl. 29—252 7 Claims



1. A machine for reclaiming boards from a board road the boards of which have nails extending from one side thereof and which must be bent flush with the board and the boards stacked in bundles 5 boards wide and 10 board layers high for reuse comprising

(a) a mobile hydraulically self-propelled steerable vehicular frame,

(b) a first set of board receiving rolls mounted on the leading end of said vehicular frame with their axes along the major axis of the machine adapted to receive the boards with their major axes transversely of the machine on said rolls with the nails extending upwardly,

(c) pivoted dog pushers co-extensive with said board receiving rolls one set of dogs to each side of the centerline of the vehicular frame for moving and maintaining transverse alignment of the boards edgewise with their major axis normal to the vehicular frame on said board receiving rolls for moving said boards rearwardly,

(d) means carried by said vehicular frame for maintaining a single vertical layer of boards,

(e) endless chain drive means positioned to engage and move said boards edgewise rearwardly from said board receiving rolls through the machine,

(f) a rotary nail bending roll positioned at an angle less than 90°across the major axes of the machine with its rotary axis extending across at least four boards simultaneously,

(g) reciprocating rod transfer means positioned to receive a group of edgewise boards from said drive means for moving boards rearwardly of the machine,

(h) and board stacking means rearwardly of said reciprocating rod transfer means positioned to receive boards from said transfer means and to stack boards having their nails bent flat in bundle groups for reuse.

4,433,465

PROCESS FOR MANUFACTURING UNIVERSAL JOINT

Koji Nakano, Sagamihara, and Kenji Katanaga, Yokohama, both of Japan, assignors to Aida Engineering, Ltd., Sagamihara, Japan

Filed Feb. 26, 1982, Ser. No. 352,873
Claims priority, application Japan, May 27, 1981, 56-80580
Int. Cl.³ B23P *17/00, 11/00*; F16D *3/00*
U.S. Cl. 29—415 6 Claims

1. A process for manufacturing a universal joint, comprising:

punching a blank out of a metal sheet material, the blank having a hub member portion, edge member portions on the opposite ends of the hub member portion, and a pair of prong portions projecting from one of the side edges of the hub member portion;

pressing the free edges of said edge member portions to form slanted surfaces on the ends thereof and to increase the width of the blank from the original punched out size;

bending said edge member portions against said hub member portion with said slanted surfaces facing away from the surface of said hub member portion;

bending said hub member portion into a cylinder with the edge member portions abutting each other and projecting from the cylinder and with said slanted surfaces substantially aligned with the inner surface of the cylinder;

boring holes in said prong member portions to receive a pin for a cross-arm; and

securing the edge member portions together.

4,433,466

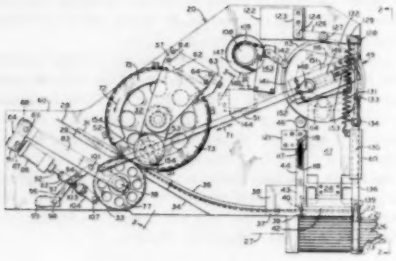
APPARATUS FOR MAKING AND USING SLOT CLOSURE WEDGES AT A COIL INJECTION STATION

Fredrick Koenig, Fort Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.

Continuation of Ser. No. 180,892, Aug. 25, 1980, abandoned, which is a division of Ser. No. 964,076, Nov. 27, 1978, Pat. No. 4,233,729. This application May 21, 1982, Ser. No. 380,798

Int. Cl.³ B23Q *41/02*; H02K *15/10*

U.S. Cl. 29—564.6 1 Claim



1. In multifunction stator wedge making and inserting and stator winding injecting apparatus having means for moving a strip of wedge material adjacent to a wedge material severing means, magazine means for receiving wedges severed from the strip of wedge material, and means for moving severed wedges into the magazine means, the improvement wherein: said means for moving a strip of wedge material comprises pinch wheel means for feeding wedge material to said severing means and for pinching wedge material and for permanently reducing the thickness of the wedge material at preselected locations, and thereby deforming the wedge material into a predetermined configuration; said apparatus includes a mechanism for controlling the operation of the pinch wheel means; said apparatus further includes means for continuously restraining the pinch wheel means from movement; wherein the pinch wheel means includes two wheels with one wheel supported at a fixed location, and the other wheel movable to different locations; and wherein the mechanism for controlling the operation of the pinch wheel means includes a toggle linkage interconnected with said other wheel and operable for determining the position of said other wheel relative to said one wheel.

4,433,467

GATE SHEARS, SAW AND MILLING TOOL ON COMMON CARRIAGE

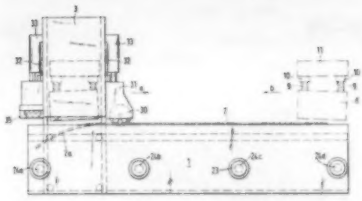
Georg Frick, Riemgrabenallee; Harro Reiff, Schloss, and Alois Kirsch, Riemgrabenallee, all of Fed. Rep. of Germany, assignors to Karl Mengele & Söhne, Gunzburg, Fed. Rep. of Germany

Filed Oct. 30, 1981, Ser. No. 316,968

Int. Cl.³ B23Q *41/00*

U.S. Cl. 29—565 6 Claims

1. Cutting machine for cutting sheet metal plates and the like comprising an elongated support table (1) having a pair of opposite spaced elongated sides, a shears frame (3) extending outwardly from and along one of the elongated sides of said support table, gate shears including a fixed blade (7*a*) and a movable blade (7*b*) each extending in the elongated direction of said support table with said support table having a length in the elongated direction thereof which is a multiple of the length of said movable blade, said movable blade is mounted on said shears frame, means for moving said shears frame back and forth along said support table, a shearing tabe (5) extending along said elongated side of said support table along which said shears frame is movable, said fixed blade is attached to one of said shearing table and said support table, and a cutting tool is mounted on said shears frame in spaced relation to said movable blade thereon, said cutting tool has a cutting edge rotatable about an axis, means on said shears frame for lifting and



lowering said cutting tool relative to said support table and shearing table, and said cutting edge of said cutting tool is arranged to cut along a line parallel to the cutting edge of said movable blade.

4,433,468

METHOD FOR MAKING SEMICONDUCTOR DEVICE HAVING IMPROVED THERMAL STRESS CHARACTERISTICS

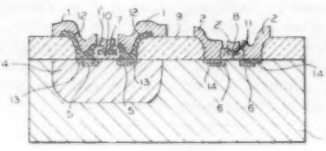
Ikuo Kawamata, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Mar. 20, 1981, Ser. No. 245,982

Claims priority, application Japan, Mar. 26, 1980, 55-38368

Int. Cl.³ H01L *21/22*, *21/265*, *21/28*

U.S. Cl. 29—571 13 Claims



1. A method of manufacturing a semiconductor device comprising the steps of providing a semiconductor layer with a main surface, forming a first semiconductor region making a PN junction with said semiconductor layer, said PN junction reaching said main surface, forming an insulating layer having a hole for exposing at least a part of said first semiconductor region on said main surface, introducing impurities having the same conductivity type as said first semiconductor region in said semiconductor layer through said hole of said insulating layer to form a second semiconductor region having a depth which is shallower than the depth of said first semiconductor region, said second semiconductor region making contact with said first semiconductor region, and forming a metal-semiconductor alloy layer electrically connected to said second semiconductor region.

4,433,469

METHOD OF FORMING A SELF ALIGNED ALUMINUM POLYCRYSTALLINE SILICON LINE

Alvin M. Goodman, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

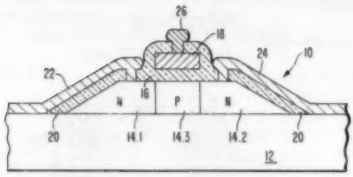
Division of Ser. No. 164,345, Jun. 30, 1980, Pat. No. 4,380,773. This application Feb. 15, 1983, Ser. No. 466,593

Int. Cl.³ H01L *21/285*

U.S. Cl. 29—571 9 Claims

1. In a process for forming a semiconductor device having a pair of active regions of a first conductivity type formed within a body of semiconductor material of a second conductivity

type at the surface of the body, the body of semiconductor material having a channel region of the second conductivity type formed therein at the surface thereof and separating the active regions, the device having a gate member aligned with the channel region and separated from the semiconductor body by a layer of insulating material and contact means in



ohmic contact with each of the active regions and the gate member respectively, an improved process for forming the gate member comprising the steps of:

heating the body to a temperature ranging between about 650° C. and 700° C.; and

flowing SiH_4 and N_2O across the semiconductor body while maintaining a given ratio of N_2O to SiH_4.

4,433,470

METHOD FOR MANUFACTURING SEMICONDUCTOR DEVICE UTILIZING SELECTIVE ETCHING AND DIFFUSION

Shuichi Kameyama, Yokohama; Koichi Kanzaki, Kawasaki, and Yoshitaka Sasaki, Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed May 14, 1982, Ser. No. 378,480

Claims priority, application Japan, May 19, 1981, 56-75185; May 19, 1981, 56-75186; May 19, 1981, 56-75188

Int. Cl.³ H01L *21/225, 21/302*

U.S. Cl. 29—577 C **9 Claims**

1. A method for manufacturing a semiconductor device comprising the steps of:

(i) forming, in a surface layer or inside a semiconductor layer of first conductivity type, a first impurity region of second conductivity type, and thereafter forming a second impurity region of first conductivity type within said first impurity region or in part of said semiconductor layer on said first impurity region;

(ii) etching part of said semiconductor layer excluding part thereof on at least said second impurity region to at least a depth of said first impurity region to form a semiconductor region, said semiconductor region including said first and second impurity regions and having a projecting shape with vertical or substantially vertical side surfaces, thus defining an etched part;

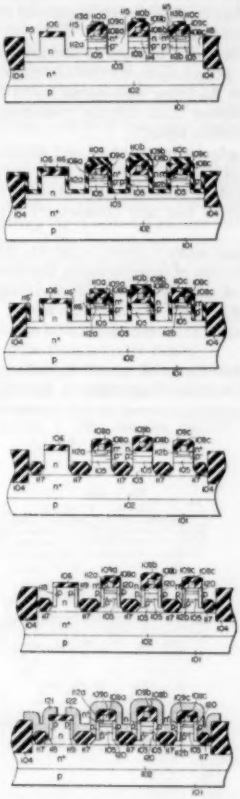
(iii) selectively forming an insulating film on a bottom surface of the etched part; and

(iv) forming an electrode on said semiconductor region, said electrode being connected to said first impurity region through the side surfaces of said semiconductor region;

wherein

step (i) for forming said second impurity region comprises depositing, on part of said semiconductor layer on said first impurity region, a conductive pattern containing an impurity of first conductivity type to serve as an impurity diffusion source for said second impurity region and an electrode for said second impurity region; and

step (ii) for etching the part of said semiconductor layer excluding the part on at least said second impurity region comprises etching the first mentioned part using said



conductive pattern or an insulating film formed by the insulating treatment of the conductive pattern as a mask.

4,433,471

METHOD FOR THE FORMATION OF HIGH DENSITY MEMORY CELLS USING ION IMPLANTATION TECHNIQUES

Wen-Chuang Ko, San Jose, and Robert L. Berry, Cupertino, both of Calif., assignors to Fairchild Camera & Instrument Corporation, Mountain View, Calif.

Filed Jan. 18, 1982, Ser. No. 340,395

Int. Cl.³ H01L *21/74*

U.S. Cl. 29—578 **9 Claims**

1. The method of forming a semiconductor structure comprising:

forming a buried interconnect layer of a first conductivity type over a selected region of a substrate of a second conductivity type, said second conductivity type being opposite said first conductivity type;

forming an epitaxial layer of said first conductivity type on said substrate such that a portion of said epitaxial layer overlies said buried interconnect layer;

forming a thin first oxide layer on the top surface of said epitaxial layer;

forming a nitride layer on said thin first oxide layer;

forming grooves in portions of the epitaxial layer so as to form exposed recessed islands of semiconductor material;

implanting a selected impurity into the exposed surface of said grooves thereby to form regions of said same conductivity type as said substrate but of higher impurity concentration than in said substrate to prevent leakage currents in the to-be-formed structure;

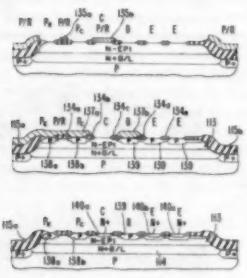
oxidizing the silicon exposed by said grooves to form in said grooves second layers of thermaliy-grown silicon oxide to a selected thickness, said second layers of said thermally-grown silicon oxide directly contacting regions of said buried contact layer;

removing selected portions of said nitride layer to expose regions of said thin first oxide layer covering portions of said island of semiconductor material in which further impurities of said first conductivity type are not to be added;

oxidizing said wafer to form a relatively thick third oxide in those portions of semiconductor material covered by said regions of said thin first oxide layer exposed by the removal of portions of said nitride layer;

removing all of the remainder of said nitride layer from said device;

forming a base exclusion mask over said structure to prevent the implantation of impurities in the underlying semiconductor material covered by said base exclusion mask, said



base exclusion mask covering at least the contact region to the buried interconnect layer and the base of the to-be-formed lateral transistor;

ion implanting an impurity of said second conductivity type to form the emitter and collector of a lateral transistor and the base and base contact of a vertical transistor in those portions of said island of semiconductor material not covered by said base exclusion mask;

removing the base exclusion mask and forming a second exclusion mask of a selected material thereby to prevent the further implantation of impurities in the emitter and collector of said lateral transistor and the base contact of said vertical transistor;

ion implanting additional regions of first conductivity type in the regions covered by the thin first oxide and not covered by the second exclusion mask or said relatively thick third oxide, thereby to form the contact region to said buried interconnect layer and the emitters of a vertical transistor;

removing the second exclusion mask from said structure; and

etching the wafer for a sufficient time to remove the thin first oxide over the surface of the wafer but so as not to damage said second and third oxide, thereby to open selected contact areas to the active regions of said device.

4,433,472

METHOD FOR MANUFACTURING A DYNAMOELECTRIC MACHINE

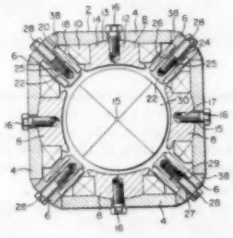
Tetsuji Andoh, Amagasaki; Shigeji Takagi, Nishinomiya, and Takeshi Sakamoto, Minoo, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 23, 1981, Ser. No. 246,407

Claims priority, application Japan, Mar. 24, 1980, 55-39128[U]

Int. Cl.³ H02K *15/02*

U.S. Cl. 29—596 **5 Claims**



1. A method of constructing a dynamoelectric machine comprising, fabricating a tubular frame stator structure made of a magnetic material and having four major sides of equal width and each disposed at an equal distance from a longitudinal axis of the frame, machining the interior surfaces of the four sides in a same single machining operation to machine a concave recess in each inner surface of each side with each concave recess having the surfaces thereof spaced equal radii from the longitudinal axis of the frame so that surfaces of concave recesses are disposed coaxial on a common circle about the longitudinal axis, providing four magnetic polepieces each having a convex mounting surface complementary to each concave recess, and mounting in a fixed position each polepiece disposed in a respective concave recess with the complementary convex mounting surface thereon disposed in a corresponding concave recess.

4,433,473

PROCESS FOR MANUFACTURING A FLYWHEEL MAGNETO

Carlo Benedetti, Pisa, Italy, assignor to Piaggio & C. S.p.A., Genoa, Italy

Filed Jul. 15, 1981, Ser. No. 283,463

Claims priority, application Italy, Jul. 22, 1980, 23614 A/80

Int. Cl.³ H02K *15/02*

U.S. Cl. 29—598 **6 Claims**

1. A method of manufacturing a flywheel magneto of the radial flux type comprising forming a preassembled unit having an outer annular ring of a ferromagnetic material, a predetermined number of magnets positioned on the inner surface of the ring and a like number of pole pieces positioned on the inner surface of the magnets by permanently deforming an inner annular ring to retain the magnets and pole pieces in position against the outer annular ring, said permanent defor-

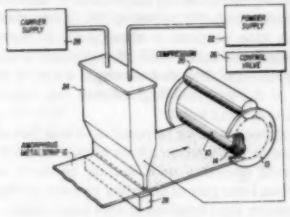
mation being effected by exerting axial force to the ring thereby causing radial expansion thereof; and subsequently casting the flywheel body onto the pre-assembled unit.

4,433,474

AMORPHOUS MAGNETIC CORE AND PROCESS FOR MANUFACTURING TO IMPROVE EFFICIENCY

Naim Hemmat, Mendham, N.J., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Oct. 8, 1981, Ser. No. 309,808
Int. Cl.³ H01F *7/06*
U.S. Cl. 29—605 **9 Claims**



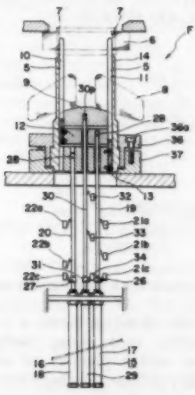
1. In a method for winding magnetic cores for electromagnetic devices including the step of winding a strip of magnetic material in layers to form the core, the improvement comprising the step of filling interstitial gaps between successive layers of said magnetic material with a filler of magnetically permeable powder.

4,433,475

COIL INSERTION APPARATUS

Tadashi Kubota, Katano; Tokuhito Hamane, Hirakata, and Masaaki Tasai, Kadoma, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Nov. 16, 1981, Ser. No. 321,928
Claims priority, application Japan, Nov. 21, 1980, 55-164973
Int. Cl.³ H02K *15/06*
U.S. Cl. 29—736 **5 Claims**



1. A coil insertion apparatus comprising:

a plurality of blade members arranged in an annular configuration and spaced at predetermined intervals for guiding a coil into slots in a core of a stator for a rotary electrical machine, the plurality of blade members being divided into a plurality of groups of blade members;

a coil pusher within said annular configuration and vertically reciprocable in the axial direction of said blade members for inserting coil into the slots under pressure by utilizing said blade members as guides;

separate blade holders, one for each group of blade members, and to which the blade members of the respective groups are attached, said blade holders being movable in the axial direction of said blade members independently of each other;

an independent driving means for each of said plurality of blade holders and for said coil pusher, said blade holders and coil pusher being movable by said driving means through a distance for carrying coils to be inserted completely through the core; and

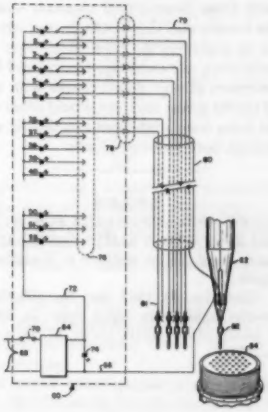
control means operatively associated with said driving means and responsive to movement of said blade holders and said coil pusher to any one of a plurality of predetermined operative positions during the movement thereof and for controlling the operation of the corresponding driving means for carrying out a predetermined sequence of operations of the corresponding blade holder or coil pusher.

4,433,476

PIN INSERTION TOOL

Timothy F. Bailey, Springfield, and Dennis S. Brunelle, South Hadley, both of Mass., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Apr. 1, 1982, Ser. No. 364,347
Int. Cl.³ H01R *43/00*
U.S. Cl. 29—752 **12 Claims**



1. In apparatus for fabricating a cable, a press for inserting an element attached to the end of a conductor of the cable into a cable connector comprising:

(a) a base;

(b) a column mounted on a substantially perpendicular to the base;

(c) a two-axis position guide for supporting the cable connector on the base so as to prevent the cable connector from rotating, the two-axis position guide located on the base adjacent the column;

(d) means for holding an element attached to the end of a conductor of the cable having a stationary jaw member with a recessed region to accommodate a conductor and having a movable jaw member supported by the stationary jaw member with a recessed region to accommodate a conductor;

(e) means slidably engaged on the column for supporting the holding means;

(f) means for restraining the motion of the slidably engaged support means substantially perpendicular to the two-axis position guide; and

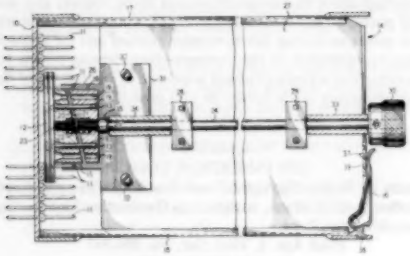
(g) means for moving the slidably engaged support means through a limited distance along the column.

4,433,477

KEYING BLOCK EXTRACTING TOOL

James D. Karga, Reynoldsburg, and Harold E. McCullough, Blacklick, both of Ohio, assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 16, 1981, Ser. No. 321,585
Int. Cl.³ H05K *3/32, 13/04;* **H01R** *43/00*
U.S. Cl. 29—764 **13 Claims**



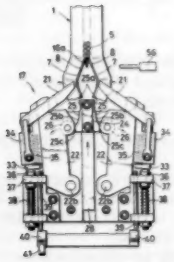
1. A pin seizing mechanism comprising: a pair of vise blocks having coaxial holes dimensioned to admit said pin through both said vise blocks, said vise blocks having opposing parallel faces lying at an angle less than 90 degrees from the longitudinal axes of said holes; and means for forcing said faces together to cause movement of one of said blocks with respect to the other of said blocks across said face of said other of said blocks to move said holes from a common axis to grip said pin when admitted through both said vise blocks.

4,433,478

METHOD OF AND APPARATUS FOR ATTACHING BOTTOM STOPS TO A SLIDE FASTENER CHAIN

Yoshio Oyama, Asabi, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed Mar. 23, 1982, Ser. No. 360,932
Claims priority, application Japan, Mar. 24, 1981, 56-42625
Int. Cl.³ A41H *37/06;* **B21D** *53/50, 53/52;* **A44B** *19/00*
U.S. Cl. 29—767 **10 Claims**



1. An apparatus for attaching bottom stops to a slide fastener chain including a pair of continuous stringers, each stringer having successive spaced groups of coupling elements mounted on a continuous stringer tape along a beaded edge thereof and interengaged with opposed complementary groups of coupling elements on the other stringer tape, the fastener chain having successive spaced pairs of opposed blank tape portions between the successive pairs of coupling element groups, each of the bottom stops having two pairs of gripping legs at opposite sides, said apparatus comprising:

(a) a frame having a guide table for supporting thereon the fastener chain;

(b) means for moving the fastener chain longitudinally along a path over said guide table in a predetermined direction;

(c) means for sensing the arrival of one of the successive spaced pairs of coupling element groups to terminate the movement of the fastener chain;

(d) means responsive to said arrival for spreading apart one of the successive pairs of opposed blank tape portions;

(e) means for placing and retaining one bottom stop at a fixed point between the spaced pair of opposed blank tape portions;

(f) said spreading means being responsive to said setting of said one bottom stop for releasing the spread pair of opposed blank tape portions to thereby allow the same to come toward each other until the opposed beaded tape edges respectively threaded through a space between each pair of the gripping legs of said one bottom stop retained at said fixed point;

(g) said moving means being responsive to said threading for further moving the fastener chain along the path in said predetermined direction until leading endmost coupling elements of said one pair of coupling element groups reach said one bottom stop retained at said fixed point;

(h) said spreading means being responsive to said reaching for compressing the opposed beaded tape edges against said one bottom stop on opposite sides; and

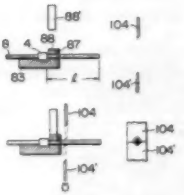
(i) said placing and retaining means being responsive to said compressing for clinching each pair of gripping legs of said one bottom stop about the compressed beaded tape edge of a respective one of the stringers.

4,433,479

METHOD OF MAKING A WIRE HARNESS

Yoshitsugu Suzuki, Mishima; Syogo Iizuka, Cotenba; Shigeo Kajiyama, Shizuoka; Kenji Usui, Gotenba, and Masahiro Kobayashi, Susono, all of Japan, assignors to Yazaki Corporation, Tokyo, Japan

Division of Ser. No. 80,682, Oct. 1, 1979. This application Jan. 8, 1981, Ser. No. 223,234
Claims priority, application Japan, Sep. 29, 1978, 53-120280; Nov. 20, 1978, 53-142212; Nov. 20, 1978, 53-142213
Int. Cl.³ H01R *43/00*
U.S. Cl. 29—825 **11 Claims**



1. A method of manufacturing a wire harness comprising the steps of:

(a) arranging a plurality of wiring blocks at predetermined spacing therebetween, each wiring block carrying a bridge adapted to hold a plurality of covered wires thereon at their end portions extending from the bridge by equal amounts;

(b) engaging one free end portion of a covered wire on one wiring block of said plurality of wiring blocks;

(c) extending said covered wire above a second wiring block of said plurality of wiring blocks;

(d) engaging the covered wire on said second wiring block to cut said wire at a predetermined position beyond the engaged portion thereof, said engaging and extending steps (b), (c), (d) including a feeding of said wire in a

direction perpendicular to a plane of the harness and, step (d) further including a cutting of said wire at the site of said second wiring block independently of the presence of a second wire contiguous to said covered wire;

(e) repeating the steps of (a) to (d) whereby a plurality of covered wires is laid out between intended wiring blocks; and

(f) fastening each covered wire to the related bridge wherein said bridge has a nipping meands disposed nearby and each step of (b) and (d) includes a step of nipping said wire by said nipping means.

4,433,480

METHOD OF INSTALLING CERAMIC FIBER BLOCKS

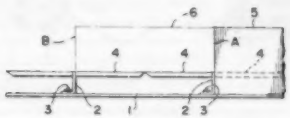
Takeo Kato, Aichi, Japan, assignor to Isolite Babcock Refractories Co., Ltd., Hoi, Japan

Filed Aug. 18, 1981, Ser. No. 293,935

Claims priority, application Japan, Aug. 19, 1980, 55-113670

Int. Cl.³ B23P *11/00*

U.S. Cl. 29—432 **4 Claims**



1. A method of installing ceramic fiber blocks on a furnace casing, which comprises providing support members each having an L-shaped cross-section, one leg of said L-shaped member having a hole therein for receiving a fastener for securing said support member to said casing, the other leg of said L-shaped member carrying two supporting bars extending in opposite directions; attaching a first supporting member to said casing by securing said one leg thereof to said casing; piercing one end surface of a ceramic fiber block with one of said supporting bars extending from said supporting member in a cantilevered pattern in spaced apart relationship to said casing; inserting said supporting bar into said ceramic fiber block until said one end surface thereof reaches said supporting member, whereby said block is temporarily supported on said casing; piercing the opposite end surface of said block from said one end surface with a supporting bar projecting from a second supporting member in a cantilevered pattern which is not attached to said casing; inserting said supporting bar of said second supporting member into said block to bring said second supporting member into contact with said opposite end surface of said block in a properly adjusted position; and then attaching said second supporting member to said casing by using a fastener inserted through said hole in said one leg of said support member, whereby said block is secured to said casing.

4,433,481

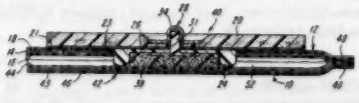
METHOD OF MOUNTING MEDICAL ELECTRODE ASSEMBLY

Roman Szpur, 2685 Culver Ave., Dayton, Ohio 45429

Division of Ser. No. 150,207, May 15, 1980, Pat. No. 4,327,737. This application Mar. 18, 1982, Ser. No. 359,219

Int. Cl.³ H01R *43/02*

U.S. Cl. 29—878 **10 Claims**



1. A method of producing a medical electrode assembly comprising the steps of die-cutting a sheet of flexible material carried by a flexible carrier sheet of air-impervious material to form a retaining pad releasably attached to the carrier sheet by pressure-sensitive adhesive, cutting an opening within the carrier sheet while the retaining pad is attached to the carrier sheet and in covering relation to the opening, securing electrical conducting means to the retaining pad with the electrical conducting means projecting through the opening, forming a flexible bottom cover sheet of air-impervious material, providing at least one of the sheets with an inner coating of plastics material, and securing edge portions of the carrier sheet and the bottom cover sheet together by applying heat and pressure to the edge portions for melting the coating of plastics material to seal the carrier sheet to the bottom cover sheet in only an area outwardly of the retaining pad and completely around the retaining pad to form an enclosed air-tight chamber for the electrical conducting means.

4,433,482

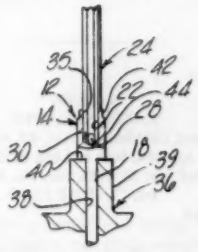
METHOD OF MAKING AN ELECTRICAL CONTACT

Leroy W. Fairbairn, Sidney, and Clifford R. Waldron, Niverville, both of N.Y., assignors to The Bendix Corporation, Southfield, Mich.

Continuation of Ser. No. 84,959, Nov. 15, 1979, abandoned. This application Nov. 24, 1981, Ser. No. 324,714

Int. Cl.³ H01R *43/04*

U.S. Cl. 29—882 **8 Claims**



1. A method of forming a medial collar portion on an electrical contact, the steps of the method comprising:

providing a holder (**12**) having first and second generally cylindrical end portions (**18, 14**), the second end portion (**14**) formed with an axially inwardly extending passage (**22**),

providing a plurality of axial wires (**24**),

inserting the wires into the passage so that each wire has its like forward end extending beyond the one end of the holder for mating,

providing in spaced relation a pair of movable dies (**36, 46**), each die (**36, 46**) having an opening (**38, 48**) sized to receive, respectively, the end portions (**18, 14**) of the holder,

positioning the first end portion (**18**) into opening (**38**),

positioning the second end portion into the opening (**48**), and

swaging the holder by movement of die (**46**) from the forward end of the passage along the entire length of the passage in an axial direction so that an outer wall portion of the holder is squeezed radially outwardly to form the retention collar medially of the holder end portions and so that an inner wall portion of the holder defining the axial passage is pushed radially inwardly to secure the wires within the passage.

4,433,483

RAZOR ASSEMBLY

Wayne P. Lazarus, Fernleigh Rd., Fernleigh via Ballina, New South Wales, Australia

Filed May 7, 1982, Ser. No. 376,037

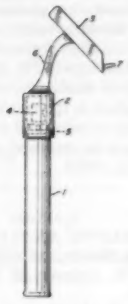
Claims priority, application Australia, May 8, 1981, PE 8764; Aug. 14, 1981, PF 0234

Int. Cl.³ B26B *21/44*

U.S. Cl. 30—41 **4 Claims**

1. A disposable razor assembly, which comprises a handle

portion comprising an elongate aerosol canister containing shaving foam and having a foam release valve at one end thereof; and a head portion comprising a cap removably at-



tached to the handle portion and enclosing the valve, and a razor head mounted on the cap; the arrangement being such that the cap must be removed to allow foam to be dispensed.

4,433,484

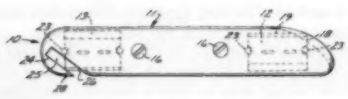
CABLE STRIPPER

Gerald L. Antisdel, 1009 Stanley Ave. #5, and Robert J. Picard, 1009 Stanley Ave. #4, both of Long Beach, Calif. 90804

Filed Sep. 28, 1981, Ser. No. 305,971

Int. Cl.³ B21F *13/00*

U.S. Cl. 30—90.4 **2 Claims**



1. In combination with first and second convention single edge razor blades, a hand tool in which said first and second blades are so mounted that an outer plastic sheath on an electrical cable may be engaged and slit by a single longitudinal movement of the tool relative to said cable to expose portions of a plurality electric conductors situated within said sheath that have plastic coatings extending therearound that may be sequentially removed by longitudinally slitting said coatings with said hand tool, said tool including:

a. a pair of elongate rigid members that have first and second end portions, said pair of rigid members disposed side by side with said first and second razor blades situated in cutting positions between said first and second end portions, said first end portions defining a downwardly and rearwardly extending hook that is separated from the balance of said pair of members by a transverse space that is spanned by said first razor blade, said hook serving to engage an end of said sheath and force said first blade into slitting engagement with said sheath as said tool is moved longitudinally away from said end, and said second end portion-s defining a longitudinal groove therebetween into which said second razor blade extends to slit said plastic coatings on said electrical conductors as each of said conductors is moved logitudinally through said groove; and

b. means for removably supporting said first and second elongate rigid members side by side with said first and second razor blades situated therebetween.

4,433,485

MEASUREMENT OF THE DIMENSIONS OF FOOTWEAR LASTS

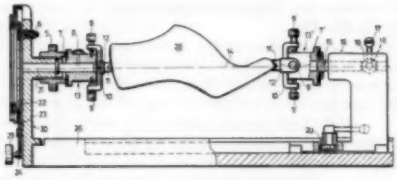
Jenö Keszei; László Varga, and Jenö Domáth, all of Budapest, Hungary, assignors to Mübör és Cipöipari Bor, Budapest, Hungary

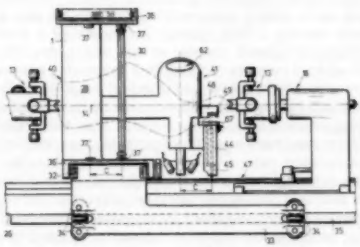
Continuation of Ser. No. 295,238, Aug. 21, 1981, abandoned, which is a continuation of Ser. No. 123,421, Feb. 21, 1980, abandoned, which is a continuation of Ser. No. 973,082, Dec. 26, 1978, abandoned, which is a continuation of Ser. No. 793,790, May 5, 1977, abandoned. This application Sep. 27, 1982, Ser. No. 423,947

Claims priority, application Hungary, May 14, 1976, BOP 1614

Int. Cl.³ G01B *5/20*; **A43D** *1/00*

U.S. Cl. 33—3 R **8 Claims**





5. An apparatus for examining the dimensions of a shoe last, comprising means for clamping a last both at the heel and at the tip comprising holding tips which are independently adjustable horizontally and vertically to enable the last to be axially displaced, a stationary writing table, means for adjusting the position of the last in the axial direction in a plane parallel to the plane of the writing table, means for obtaining a 90° angular displacement of the last whereby the vertical position may also be brought into a plane parallel with the plane of the writing table, and copying means freely movable into the plane of the writing table and comprising an exchangeable feeler for sensing the position of the last, a writing mechanism for recording the sensed position and a projection for viewing the writing table.

4,433,486

MEASURING INSTRUMENT FOR COMPRESSIBLE OBJECTS

James A. Muehlenbein, Villa Park, Ill., assignor to Novel Products, Inc., Addison, Ill.

Filed May 3, 1982, Ser. No. 373,843

Int. Cl.³ G01B *3/10*; **G01L** *5/06*

U.S. Cl. 33—137 R **14 Claims**

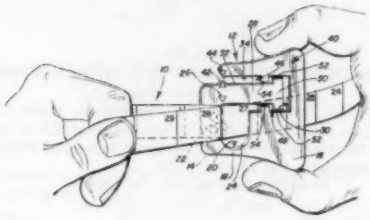
1. An instrument of measuring the girth of compressible articles under uniform tension, said instrument comprising:

a flexible tape for extension about an article and having graduations along its length; and

a one-piece tension reading member comprising first and

second sections, said first section being fixedly secured with said flexible tape;

said tension reading member having a flexible, bendable hinge portion interconnecting said first and second sections and permitting relative movement of said first and second sections, each to the other;



whereby the indication of the tension applied to the article by the flexible tape is determinable from the relative position of the first and second sections with said tape and attached first section drawn in one direction and said second section drawn oppositely to said one direction.

4,433,487

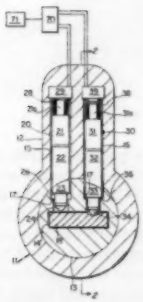
KEY READING SYSTEM

Manfred W. Roland, Mountain View, Calif., assignor to All-Lock Electronics, Inc., North Brunswick, N.J.

Filed Feb. 26, 1982, Ser. No. 352,548

Int. Cl.³ E05B *35/04*; G01B *7/28*

U.S. Cl. 33—174 F **6 Claims**



1. An apparatus for reading a key comprising:

a housing having a key opening, a key slot extending from said key opening longitudinally into the housing for receiving a key which essentially mates with the cross section of the key slot, the key slot cross section having at least one operative side which faces a side of the key which is generally flat and has reading positions thereon,

at least one pin cavity formed in the housing and intersecting the operative side of the key slot,

a reading pin mounted in the pin cavity and movable therein in a direction essentially perpendicular to said operative side of the key slot and intersecting said operative side of the key slot, means for resiliently biasing the pin to a position whereat the pin enters the key slot and is engaged by a key inserted into the key slot,

said pin having a magnetic portion,

an electronic sensor device in said housing, which device is energized to a first energy level when a magnet is placed into a certain close position relative thereto, and to a second energy level when the magnet is placed at farther position relative thereto, said electronic sensor device mounted in the housing in the vicinity of the magnetic portion of the pin, such that when one of a high surface or low surface on a key is located at a reading position of the pin, the pin is moved against the resilient bias to position said magnetic portion at said close position to place the electronic sensor device at its first energy level, and wherein when the other of the high or low surface of the key is at the reading position of that pin, the pin is moved against the resilient bias such that the magnetic portion thereof is located at said farther position to place the electronic sensor device at said second energy level.

4,433,488

DEVICE FOR SETTING THE CUTTING EDGE OF A TOOL FITTED IN A TOOL-HOLDER EXTERNALLY OF A MACHINE TOOL, OR FOR MEASURING THE SETTING OF SAID EDGE

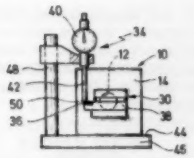
Richard Baumgartner, Rosenheim, Fed. Rep. of Germany, assignor to Index-Werke Komm.-Ges. Hahn & Tessky, Rosenheim, Fed. Rep. of Germany

Filed Mar. 8, 1982, Ser. No. 355,497

Claims priority, application Fed. Rep. of Germany, Mar. 28, 1981, 3112417

Int. Cl.³ G01B *5/00*; B27G *23/00*

U.S. Cl. 33—185 R **10 Claims**



1. A gauge for a cutting tool having a cutting edge and carried by a tool holder, said gauge comprising a gauge body; retaining means on said gauge for securing a tool holder to the gauge body; said retaining means locating a tool cutting edge in a predetermined setting plane for such cutting edge; said gauge body having parallel first and second sides and a third side located at a predetermined distance from the setting plane; said predetermined distance being equal to the distance between the first and second sides.

4,433,489

VEHICLE ALIGNMENT APPARATUS AND METHODS

William A. Boyce, Huntington Beach, Calif., assignor to Macaster Controls, Inc., Huntington Beach, Calif.

Filed Jan. 5, 1982, Ser. No. 337,252

Int. Cl.³ G01B *5/255, 3/56, 3/00*

U.S. Cl. 33—203.18 **15 Claims**

1. Wheel alignment measuring apparatus adapted to facilitate manual alignment measurements relative to the conventional front and rear sets of tires of an automobile, truck or trailer vehicle through the use of a pair of conventional tape measures by one person while the tires are carrying the weight of the vehicle, said apparatus comprising:

a pair of elastic bands, adapted to stretch across the width of the vehicle, each band having its center marked, and having connection means at each free end thereof disposed equidistant from the center mark;

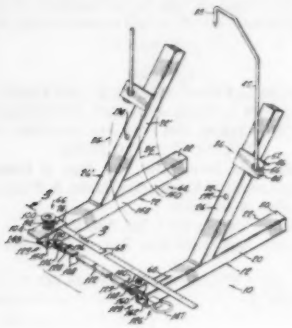
a pair of frames adapted to be disposed respectively on opposite sides of the vehicle loosely adjacent the outer circular side wall peripheries of the exposed tires in a chosen set;

each of said frames including an elongated cross bar having coplanar surfaces disposed in spatial relationship to engage different locations on the circular side wall periphery of either of said exposed tires in the chosen set;

each of said frames also including means for detachable

hanging the frame on either of said exposed tires in loose proximity to the side wall thereof;

said cross bars of both frames including means for detachably securing near opposite ends thereof, and at cooresponding locations parallel or even with said coplanar surfaces of the cross bars as measured transversely of the cross bars, the connection means at the free ends of the pair of elastic bands;



at least one of said frames having hold-down means for detachably capturing the free ends of a pair of conventional tape measures near opposite ends of the cross bar at corresponding positions equally spaced from or even with said coplanar surfaces of the cross bar as measured transversely of the cross bar.

4,433,490

FLEXIBLE SURVEYOR'S MARKER

Charles E. Black, P.O. Box 791, Richmond, Ky. 40475

Filed Apr. 23, 1982, Ser. No. 371,432
Int. Cl.³ G01C *15/02, 15/06*
U.S. Cl. 33—293 **12 Claims**

1. A surveyor's marker comprising an elongated strip of relatively stiff, flexible, foldable material which includes

a body portion containing a crease which extends the length thereof along a longitudinal centerline, and

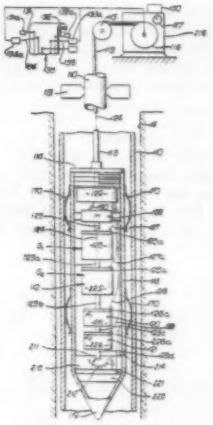
a pair of tabs attached to one end of said body portion along a transverse fold line, said tabs defining nail holes through the center thereof and being slidable one across the other to a position wherein said nail holes register with one another, said body portion being tiltable out of a plane containing said tabs toward a direction perpendicular to said tabs as said tabs are slid across one another to a position wherein said nail holes are registered with one another.

4,433,491

AZIMUTH DETERMINATION FOR VECTOR SENSOR TOOLS

Paul W. Ott, Pasadena; Harold J. Engebretson, Yorba Linda; Philip M. LaHue, West Lake Village, and Brett H. Van Steenwyk, San Marino, all of Calif., assignors to Applied Technologies Associates, San Marino, Calif.

Filed Feb. 24, 1982, Ser. No. 351,744
Int. Cl.³ G01C *19/38*
U.S. Cl. 33—302 **32 Claims**



15. In borehole survey apparatus wherein angular rate sensor means and acceleration sensor means are suspended and effectively rotated in a borehole, the angular rate sensor means having amplitude output GA and rotation related phase output GP, and the acceleration sensor means having amplitude output AA and rotation related phase output AP, there also being means supplying a signal value Ω_T proportional to earth's angular rate of rotation, the improvement which comprises

(a) first means for combining AA, AP, GA, GP and Ω_T to derive a value ψ for borehole azimuth at the level of said sensor means in the borehole.

4,433,492

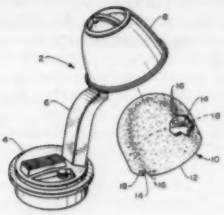
HAIR DRYER INSERT TO MAINTAIN HAIR POSITION

Ralph Santa Lucia, 948 Rose Ave., Venice, Calif. 90291

Continuation-in-part of Ser. No. 139,834, Apr. 14, 1980, abandoned. This application Apr. 3, 1981, Ser. No. 250,571
Int. Cl.³ A45D *20/24*
U.S. Cl. 34—99 **16 Claims**

1. A fluid diffusion member for use with heated fluids, comprising: a non-planar conformable member of open-pore, lightweight material, being shaped and adapted for cooperative association with a source of heated fluid, and having a thickness sufficient to satisfactorily diffuse the heated fluid emanating from said source, said diffusion member being spaced from

the object to be heated and wherein said heat source is a hooded hair dryer and said fluid diffusion member is congruently shaped to the configuration of the interior of the hood of said hooded hair dryer.



4,433,493

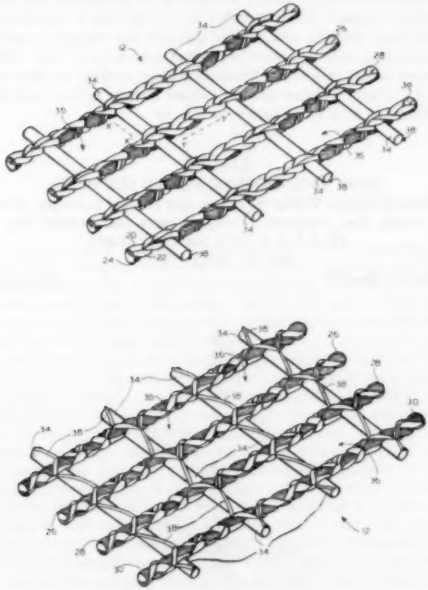
HIGH TEMPERATURE RESISTANT FABRICS

William H. Poisson, Lincoln, Mass., assignor to Albany International Corp., Albany, N.Y.

Filed Jan. 20, 1983, Ser. No. 459,417

Int. Cl.³ B32B *5/08*

U.S. Cl. 34—116 **5 Claims**



1. A fabric which comprises an open mesh of:

(a) at least three warpwise elements in each of an array of parallel warp knitted chains extending in the machine-direction, said chains being evenly spaced from each other in intervals of from 2 to 12 per inch of fabric, said elements comprising:

(i) a first chain stitch yarn;

(ii) a second chain stitch yarn with periodic underlaps connecting adjacent chains;

(iii) a first reinforcing lay-in yarn having a linear density of from about 400 to about 1000 denier; and optionally

(iv) a second reinforcing lay-in yarn having said linear density;

provided that when the yarn (iv) is not present then the linear density of yarn (iii) is doubled; and

(b) a plurality of cross machine-direction yarn components, evenly spaced from each other in intervals of from 2 to 12 per inch of fabric and positioned between the warpwise elements (i), (ii) and (iii).

5. In a method of drying a textile fabric by supporting the fabric on a conveyor belting and conveying the supported fabric through a drying oven, the improvement which comprises: employing as the conveyor belt an endless fabric, which comprises: an open mesh of:

(a) at least three warpwise elements in each of an array of parallel warp knitted chains extending in the machine-direction, said chains being evenly spaced from each other in intervals of from 2 to 12 per inch of fabric, said elements comprising:

(i) a first chain-stitch yarn;

(ii) a second chain-stitch yarn with periodic underlaps connecting adjacent chains;

(iii) a first reinforcing lay-in yarn having a linear density of from about 400 to about 1000 denier; and optionally

(iv) a second reinforcing lay-in yarn having said linear density; provided that when the yarn (iv) is not present then the linear density of yarn (iii) is doubled; and

(b) a plurality of cross-machine direction yarn components evenly spaced from each other in intervals of from 2 to 12 per inch of fabric and positioned between the warpwise elements.

4,433,494

ARTICLE OF CLOTHING OR ACCESSORY INTENDED TO ADAPT ITSELF CLOSELY TO A PART OF THE HUMAN BODY AND A PROCESS FOR ADAPTING THIS ARTICLE OR ACCESSORY TO THIS PART OF THE HUMAN BODY

Guy Courvoisier, and Simon Arieh, both of Geneva, Switzerland, assignors to Lange International S.A., Fribourg, Switzerland

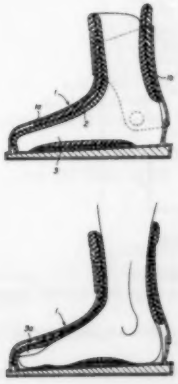
PCT No. PCT/CH79/00047, § 371 Date Dec. 6, 1979, § 102(e) Date Dec. 4, 1979, PCT Pub. No. WO79/00886, PCT Pub. Date Nov. 1, 1979

PCT Filed Mar. 29, 1979, Ser. No. 177,765

Claims priority, application Switzerland, Apr. 6, 1978, 3695/78

Int. Cl.³ A43B *5/04; A42B 3/00*

U.S. Cl. 36—119 **7 Claims**



7. A ski boot comprising:

a shell of inextensible material and including a sole and an upper connected to said sole;

a sock adapted to receive the foot of a wearer and comprising a thermoformable foam adapted to line the interior of said shell and dimensioned so that said foam is placed

under reciprocal pressure between opposing portions of said shell and said foot; and

a resistance heater embedded in said sock and energizable to heat said foam to a thermoforming temperature tolerable by the wearer for a period sufficient to cause said foam to flow until the stresses resulting from the reciprocal pressures are eliminated.

4,433,495

DIGGER WITH SUPPORTING BASE PIVOTABLE ON TRANSVERSIBLE MEMBER

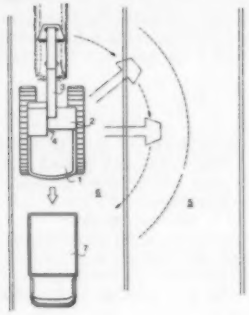
Mitsuhiro Kishi, 1320 Mizuhohocho,, Ashikaga-shi, Tochigi-Pref. 326-03, Japan

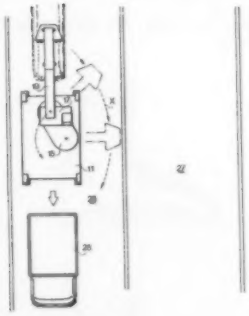
Filed Jan. 27, 1982, Ser. No. 342,998

Claims priority, application Japan, Jan. 31, 1981, 56-13114; Jan. 31, 1981, 56-13115; Jan. 31, 1981, 56-13116; Jan. 31, 1981, 56-13117; Jan. 31, 1981, 56-13113; Mar. 20, 1981, 56-41288

Int. Cl.[3] **E02F** *5/02*

U.S. Cl. 37—103 **20 Claims**





1. A digger comprising:

a carrier having a stage thereon and supporting wheels and trestles,

a transversible member angularly movably mounted on said stage,

a supporting base angularly movably mounted on said transversible member,

a digging-up mechanism including a bucket crane operatively supported on said supporting base, and

means on said transversible member for rotating said digging-up mechanism about a first axis thereof in response to angular movement of said transversible member about a second axis thereof.

4,433,496

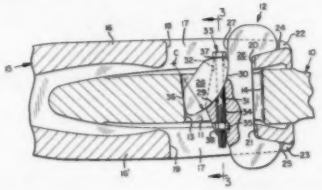
LOCKING DEVICE FOR EXCAVATING EQUIPMENT

Larren F. Jones, Beaverton, and Jeffrey P. Earll, Portland, both of Oreg., assignors to ESCO Corporation, Portland, Oreg.

Filed Mar. 14, 1983, Ser. No. 475,186

Int. Cl.[3] **E02F** *9/28*

U.S. Cl. 37—141 R **8 Claims**



1. A locking device for securing a slip-over forwardly projecting adapter to an excavator lip comprising a C-clamp member straddling said lip while extending through vertically aligned openings in said adapter and lip, and a wedge member also extending through said aligned openings and forwardly of said clamp member, said clamp member having a forward facing wall confronting said wedge member and having a forwardly projecting arcuate surface, said wedge member having a rearwardly facing wall having an arcuate contour for sliding on said C-clamp member arcuate surface, a bolt means extending through said arcuate surfaces and releasably interconnecting said members whereby tightening of said bolt means causes said wedge member arcuate contour to slide on said C-clamp member arcuate surface to bear against said lip opening to lock said adapter on said lip.

4,433,497

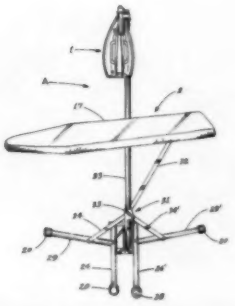
IRON AND IRONING BOARD SUPPORT

Edwin E. Foster; Wilbur A. Foster, and Thomas E. Foster, all of Austin, Tex., assignors to Majik-Ironers, Inc., Austin, Tex.

Filed Jan. 4, 1982, Ser. No. 336,847

Int. Cl.[3] **D06F** *71/00*

U.S. Cl. 38—107 **12 Claims**



1. Compact, collapsible ironing apparatus comprising a base (**20**) providing supportive disposition upon a supporting surface for carrying an ironing board (**17**) and for supporting a hand iron (**1**) above the ironing surface of said ironing board, said base comprising a first upright member (**23**) extending upwardly therefrom and means (**36**) pivotally securing said ironing board to the upper end of said first upright member for swingable movement upon a pivot axis between storage and use positions, and a second upright member (**21**) extending upwardly from said base, an iron support linkage (**15, 16**) swingably interconnected at one end to the upper end of said second upright member and extendable to positions over said

ironing surface, and iron securement means (9) pivotally interconnecting the other end of said support linkage with said iron for permitting movement of said iron between first and second orientations, respectively, in and out of contact with said ironing surface, said base comprising folding support members (32, 34, 34') movable between storage and use positions conjointly with swinging movement of said ironing board between its respective storage and use positions, said folding support members of said base comprising leg members (29, 29') swingably affixed for movement between respective raised positions for storage and extended positions for use, said extended positions providing increased area of contact of said base with said supporting surface, said leg members being affixed at opposite sides of said base and when in respective extended positions projecting in opposite directions from said base.

4,433,498

HANGTAG WITH A LINK SERVING AS A FASTENING DEVICE

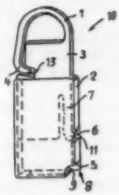
Hans Bienz, Horn, Switzerland, assignor to Stoffel Seals Corporation, Tuckahoe, N.Y.

Filed May 7, 1982, Ser. No. 376,045

Claims priority, application Switzerland, May 20, 1981, 3282/81

Int. Cl.³ G09F *3/00*

U.S. Cl. 40—2 R **12 Claims**



1. A hangtag for use as a fastening device comprising a generally flat housing having front and back portions and first and second ends, a slide means selectively receivable within said housing, said slide means having first and second end portions, a resilient loop member extending from said first end portion of said slide means, said loop member having a free end which is selectively receivable within said housing when said slide means is inserted into said first end of said housing, a first opening through said housing spaced from said first end thereof, locking means carried by said slide means and having a latching portion, a second opening in said housing, said second opening being located between said first end of said housing and said first opening, said latching portion of said locking means being at least partially and selectively receivable within said first and second openings when said slide means is inserted into said housing, said free end of said loop means being retained within said housing when said latching portion of said locking means is received within said first opening and being in nonengaging relationship with said housing when said latching portion of said locking means is received within said second opening.

4,433,499

COPY HOLDER WITH MOTOR DRIVEN LINE GUIDE

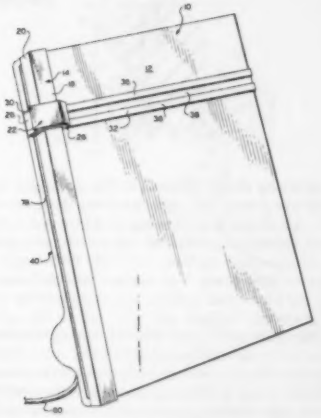
Jerry L. Sharber, Toledo, and Ronald E. McNeal, Wapakoneta, both of Ohio, assignors to Sheller Globe, Toledo, Ohio

Continuation of Ser. No. 206,867, Nov. 14, 1980, abandoned. This application Jun. 29, 1983, Ser. No. 509,588

Int. Cl.³ B41J *11/64*

U.S. Cl. 40—356 **6 Claims**

1. A copy holder comprising: a face plate defining a generally planar front copy support surface, said face plate provided with a track means extending longitudinally along one marginal edge thereof; a line guide adapted to extend across the copy support surface in a generally perpendicular direction relative to said track means, said line guide having one end positioned adjacent said track means and having an unsupported opposite end; holder means attached to the one end of said line guide and slidably coupled to said track means for permitting longitudinal movements of said holder means and said line guide across the copy support surface while maintaining said line guide in generally perpendicular relationship with



said track means; electronic drive means coupled to said holder means for effecting longitudinal movement of said holder means and said line guide across the copy support surface; an elongate housing containing said electronic drive means; and a longitudinally extending channel on the rear surface of said face plate adjacent to and generally parallel with said track means, said channel receiving and retaining said elongate housing.

4,433,500

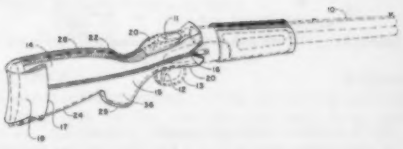
GUN GLOVE

Raymond A. Kunevicius, 6115 Elmwood Ave., Independence, Ohio 44131

Filed Jan. 25, 1982, Ser. No. 342,378

Int. Cl.³ F41C *27/00*

U.S. Cl. 42—1 N **9 Claims**

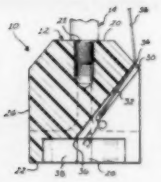


1. A cover for a long gun having a stock with a comb and a bottom portion, said cover consisting of a flexible, abrasion-resistant material having a first elastic portion covering said comb, a second elastic portion covering said bottom portion, first fastening means, second fastening means, and at least one opening in said cover, said opening being provided with elastic.

4,433,501
FISHING LURE RETRIEVING DEVICE

Gary G. Maxwell, 980 E. Dillman, Bloomington, Ind. 47401

Filed Dec. 23, 1981, Ser. No. 333,650
Int. Cl.³ A01K 97/00
U.S. Cl. 43—17.2 3 Claims

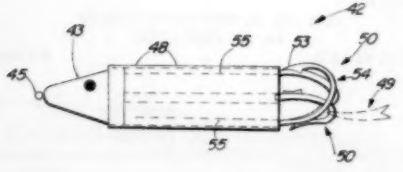


1. A retrieving device adapted to free a snagged fishing lure connected to a fishing line, said retrieving device comprising a generally cylindrical body having an upper end surface and a lower end surface, an elongated rod connected rigidly to said body at its upper end surface, said body including a side wall extending to said lower end surface and defining an open cavity in the lower end surface, said body having a longitudinal slot extending through said side wall to the center of the body within said cavity, and shiftable spring tensioned means carried by said body and spanning said slot at a location spaced inwardly from the side wall and adjacent said cavity for retaining said fishing line within said slot generally centered within said cavity, said rod being connected at one end at the center of said body upper end surface, said slot increasing in depth from top to bottom and defined in part by an end wall tapering inwardly from the outer periphery of said body adjacent its said upper end surface to said center of the body within said cavity under said rod one end, whereby said body may be guided by said rod along the fishing line to said lure with the lure fitting into the cavity for subsequent movement with the body.

4,433,502
GEOMETRIC WEEDLESS FISHHOOK ASSEMBLY

Edward J. Steeve, 7122 N. Odell, Chicago, Ill. 60631

Continuation-in-part of Ser. No. 245,101, Mar. 18, 1981. This application Jul. 15, 1981, Ser. No. 283,504
The portion of the term of this patent subsequent to May 24, 2000, has been disclaimed.
Int. Cl.³ A01K 83/02, 85/00
U.S. Cl. 43—43.2 26 Claims



15. A weedless fishhook assembly comprising:

a. a mounting stem having a forward and rear portion,

b. fastening means securely fastened to said mounting stem for the attachment of a fishing line,

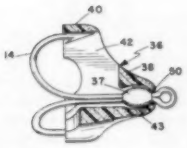
c. three fishhooks, each having a point, a bend and a shank portion, with said three fishhooks symmetrically positioned around the central longitudinal axis of the fishhook assembly whereby in an unactivated-rest-position, said shank portion of each of said fishhooks extend from said rear portion of said mounting stem at an acute angle to a central longitudinal axis of the fishhook assembly which also passes through the centerline of the forward and rear portions of said mounting stem, and where said point of each of said fishhooks is closely nested to an adjacent fishhook in such a manner that each said adjacent fishhook has only one point of a said fishhook nested close to it, and the points of said fishhooks are located on the outside of said fishhook assembly, and

d. resilient means cooperating between each of said fishhooks and said mounting stem for moving said point of each said fishhook away from the closely-nested, unactivated-rest-position to an activated-open-position whereby the points of said fishhooks are exposed for snagging fish.

4,433,503
FISH HOOK APPARATUS WITH COVERING BODY PORTION

George H. Schleif, 1450 Chestnut Ave., Carlsbad, Calif. 92088

Filed Aug. 10, 1981, Ser. No. 291,801
Int. Cl.³ A01K 83/00, 85/00
U.S. Cl. 43—42.1 9 Claims



1. A hook apparatus for being pulled through the water comprising:

an integral and substantially rigid fish hook having an eye and a hook portion on a shank,

a body for being mounted on said fish hook and covering the pointed end of said hook when the body is in a normal position,

said body comprising a lure shaped housing of resilient material slidably mounted on said shank of said fish hook and having an opening in the side thereof for said hook portion to pass therethrough when said body is moved from said normal position to a second position,

said shank having an enlarged portion formed integrally thereon adjacent said eye, which enlarged portion forms a bob,

the upper end of said body having a resiliently expandable hole being formed by a relatively thin continuous annular upper end body wall through which said shank passes, with the diameter of said hole being smaller than the diameter of said bob and the diameter of said eye,

said body being in the normal position on said fish hook when said upper end hole fits between said eye and said bob,

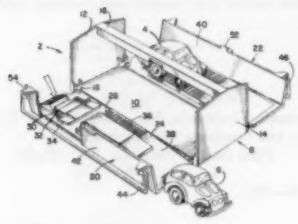
and said upper end hole being movable over said bob for moving said body to said second position and exposing said hook portion upon said body being bit or contacted forcefully by a fish when the hook apparatus is being moved through the water.

4,433,504

CONTAINER AND START APPARATUS FOR TOY CARS

Masumi Terui, Matsudoshi, Japan, assignor to Takara Co., Ltd., Tokyo, Japan

Filed May 24, 1982, Ser. No. 381,364
Claims priority, application Japan, May 27, 1981, 56-75762[U]
Int. Cl.³ A63H 33/00
U.S. Cl. 46—11 17 Claims



1. A combination storage container and launching apparatus for self propelled miniature vehicles comprising:

a base member capable of supporting a miniature vehicle for storage;

at least one wall member movably connected to the base member from a first storage position wherein at least a portion of the wall member is traverse to the base member to a second launching position, wherein that portion of the wall member is approximately parallel to the base member;

means on the wall member for supporting and restraining a miniature vehicle, capable of self propulsion, in a stationary position, when the wall member is positioned approximately parallel to the base member, and

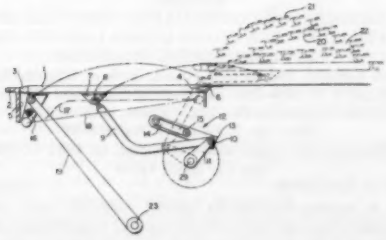
means on the wall member for releasing the miniature vehicle to permit propulsion of the vehicle.

4,433,505

SWINGING PLUG DOOR

George C. Viner, Chippenham, England, assignor to Westinghouse Brake and Signal Co., Ltd., Chippenham, England

Filed Aug. 25, 1981, Ser. No. 296,163
Claims priority, application United Kingdom, Sep. 4, 1980, 8028629
Int. Cl.³ E05C 7/06
U.S. Cl. 49—110 10 Claims



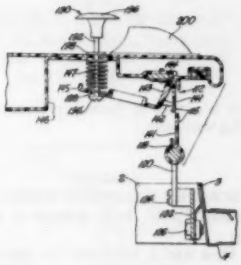
1. A swinging plug door comprising a plug door pivotally attached to one end of a swinging lever which is pivotally attached at its other end to a rotatable driving crank and, intermediate said ends has a sliding fulcrum mechanism in which the fulcrum axis of the lever is slidable along a path lying in a direction generally between the crank and the door such that, in operation, rotation of the crank causes the lever to swing about its fulcrum axis and to slide relative thereto to carry the door through a flattened arc between open and closed positions.

4,433,506

COMBINED VENT AND ESCAPE HATCH

Donald L. Manning, Orchard Lake, Mich., assignor to Transpec, Inc., Troy, Mich.

Filed May 12, 1982, Ser. No. 377,514
Int. Cl.³ E05B 65/10
U.S. Cl. 49—141 8 Claims



1. In combination with a vehicle roof having an opening and an upwardly movable hinged lid therefor, means normally limiting upward movement of the lid to a tilted position accommodating use of the opening to vent the vehicle, said means comprising a lever pivotally connected at one end to the lid for upward movement of its other end toward the underside of the lid, a bracket comprising two parts normally extending in parallel side-by-side relation to each other adjacent one side of said opening, one of said parts being fixed to the lid, and a link pivotally securing the other of said bracket parts to the vehicle roof, each of said parts having an aperture normally aligned with the aperture in the other, said lever having a projection normally engaging the aperture in each said part but movable out of engagement therewith in response to pivotal movement of said lever other end toward the lid, said lever other end having a laterally extending portion for transmitting sufficient manual upward force to the lid to effect separation of said bracket parts following disengagement of said projection from said apertures, an opening formed through the lid and handle means extending through said lid opening and operatively connected to said lever whereby said lever may be actuated both internally and externally of the vehicle roof, a knob integrally formed on said handle means and disposed exteriorly of said lid.

4,433,507

STRUCTURE FOR PREVENTING VERTICAL MOVEMENT OF A SLIDING DOOR

Takayo Chikaraishi, Kawasaki, Japan, assignor to Nissan Motor Company, Limited, Kanagawa, Japan

Filed Jul. 22, 1981, Ser. No. 286,183
Claims priority, application Japan, Jul. 26, 1980, 55-102662
Int. Cl.³ E05D 15/10
U.S. Cl. 49—213 10 Claims

1. A structure for preventing a sliding door having inner and outer panels from moving vertically, said door being connected to a vehicle body, comprising:

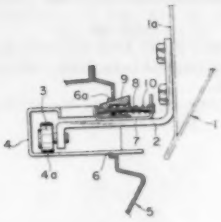
a guide rail affixed to the vehicle body, said guide rail being inwardly curved at a front end portion thereof;

a bracket affixed to the inner panel of the sliding door;

a roller attached to the bracket, said roller engaging the guide rail to enable the door to slide therealong between opening and closing positions; and

a locking element having a tapered surface sloping in a lateral direction of the vehicle body, said locking element being

attached to the bracket to enable the tapered surface thereof to engage a fixed portion of the vehicle body when the



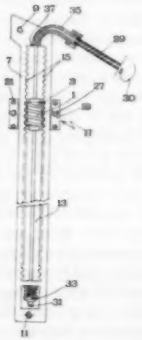
sliding door is closed to thereby prevent the sliding door from moving vertically.

4,433,508

AUTOMOBILE WINDOW REGULATOR

Giuseppe Carletta, Carde', Italy, assignor to Eugenio Murtas, Turin, Italy

Filed Apr. 1, 1982, Ser. No. 364,324
Claims priority, application Italy, Apr. 3, 1981, 67471 A/81
Int. Cl.³ E05F *11/38*
U.S. Cl. 49—348 **7 Claims**



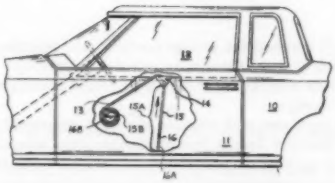
1. An automobile window regulator comprising: a cylindrical roller having on its outer surface a screw thread the axis of which coincides with that of the roller, and having an axial bore extending coaxially of the longitudinal axis of said roller; an upright rigid guide member secured to an automobile door and having inner screw thread means extending almost over its entire length for engagement with said screw thread on said outer surface of said cylinder roller; a movable pad formed of a pair of shells joined with their open sides along a central longitudinal plane coincident with a longitudinal central axis of said guide member, said movable pad embracing said guide member and being movable axially thereof and firmly secured to an automobile window glass and containing a recess for accommodating therein said cylindrical roller, said cylindrical roller being rotatable in said recess but not movable axially of said pad, said guide member and said cylindrical roller meshing with said inner screw thread means of said guide member being accommodated between said pair of shells of said movable pad; a flexible metal control cable having one end connected to a rotary actuating device and an opposite end to rotary mounting means provided below said inner screw thread means in said guide member within a lower end thereof, said flexible metal control cable being covered with a protective sheath extending from said rotary actuating device to an upper end of said inner screw thread means in said guide member; said bore in said cylindrical roller having a cross-sectional shape adapted to prevent rotation of said flexible metal control cable in said cylindrical roller in the entire portion of said flexible metal control cable corresponding to said inner screw thread means in said guide member, said cylindrical roller being provided with an axial slot of the same shape to receive said flexible metal control cable for axially slidable but not rotary movement therein; said rotary mounting means in said lower end of said guide member below said inner screw thread means thereof being rotatable but not shiftable in its height to keep said opposite end of said flexible metal control cable rotatably in place.

4,433,509

WINDOW REGULATOR

Earl E. Seppala, Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 2, 1982, Ser. No. 446,228
Int. Cl.³ E05F *11/48*
U.S. Cl. 49—352 **5 Claims**



1. A rotary input type regulator adapted to move a closure between opened and closed positions comprising a rigid track having a first end parallel to the direction of movement of the closure and a second end formed in a spiral configuration; a polymeric tape situated within the track and having a first end attached to the closure and a second end positioned within the portion of the track formed in a spiral configuration; a power transmission arm having one end rotatably mounted in the center of the spiral configuration; a drive block connected to both the second end of the polymeric tape and slideably connected to the power transmission arm and the track so as to move the second end of the tape within the end of the track formed in a spiral configuration with rotation of the power transmission arm; and a rotary input means attached to the rotatably mounted end of the power transmission arm.

4,433,510

METHOD FOR CONTROLLING THICKNESS OF WAFER-LIKE WORK PIECES UNDER LAPPING AND A LAPPING MACHINE THEREFOR

Kiyoo Katagiri, and Mitsuo Honda, both of Niigata, Japan, assignors to Shin-Etsu Engineering Co., Ltd., Tokyo and Naoetsu Electronics Co., Ltd., Niigata, both of, Japan

Filed Apr. 2, 1982, Ser. No. 364,799
Claims priority, application Japan, Apr. 10, 1981, 56-53865
Int. Cl.³ B24B *49/04*
U.S. Cl. 51—165 R **2 Claims**

2. A lapping machine for lapping wafer-like work pieces provided with a device for the in-machine measurement of the thickness of the work pieces under lapping which comprises:

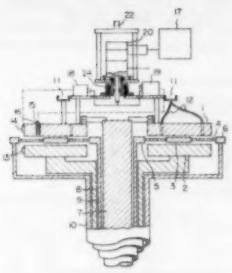
(a) an upper surface plate having a substantially horizontal lapping surface;

(b) a lower surface plate rotatable relative to the upper surface plate and having a lapping surface substantially parallel with the lapping surface of the upper surface plate to hold the work pieces under lapping with the upper surface plate therebetween;

(c) a positioning means for generating a signal intermittently

at regular intervals corresponding to one revolution of the lower surface plate relative to the upper surface plate;

(d) a sensor means for generating a signal corresponding to the width of the gap between the lapping surfaces of the upper and lower surface plates holding the work pieces therebetween; and



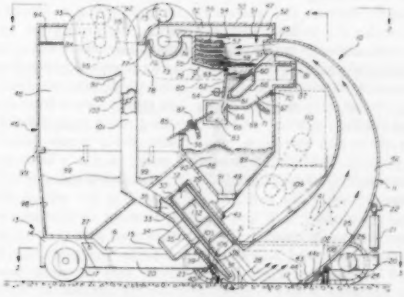
(e) a means for converting the signal generated in the sensor means into a value of the width of the gap between the lapping surfaces at each moment when a signal is generated in the positioning means.

4,433,511

MOBILE ABRASIVE BLASTING SURFACE TREATING APPARATUS

Jon M. Swain, 3114 Cedar Knoll, Kingwood, Tex. 77339

Filed May 18, 1981, Ser. No. 264,297
Int. Cl.³ B24C *3/06, 9/00*
U.S. Cl. 51—424 **21 Claims**



1. An apparatus for treating surfaces by abrasive blasting comprising

a movable housing open at the bottom and including supporting means for movement over a surface to be treated,

a reservoir for abrasive particles,

a wheel positioned in said housing, in communication with said reservoir, having a plurality of blades operable upon rotation to throw said abrasive particles at high velocity

means for rotating said wheel at high speed,

a portion of said housing supporting said wheel at an angle to said surface whereby rotation of said wheel throws abrasive particles at high velocity at an angle to said surface,

said housing having a return passage for said abrasive particles and particulate debris broken from said surface by impingement of said particles thereon extending to convey said particles and broken material toward said reservoir,

at least one horizontally oriented, downwardly inclined tray positioned in linear alignment with the end of said return passage and laterally spaced from said reservoir to receive abrasive particles and particulate debris from said return passage and positioned to overflow laterally into said reservoir,

said tray being effective to collect said abrasive particles and to absorb their kinetic energy to prevent excessive rebounding of particles and permitting said particles subsequently to continue on to said reservoir, and

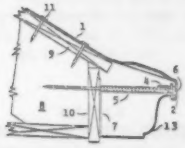
separator means for separating particulate debris from said abrasive particles oveflowing from said tray prior to returning the same to said reservor.

4,433,512

REINFORCED GUTTER HANGER SUPPORTING BAR

Harry E. Schoener, 161 Island Pkwy., Island Park, N.Y. 11558

Filed Mar. 24, 1982, Ser. No. 361,445
Int. Cl.³ E04D *13/06*
U.S. Cl. 52—11 **3 Claims**



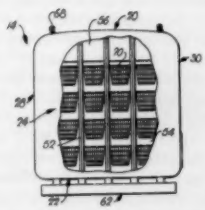
1. In a gutter hanging system including a tube extending between the front and rear walls of a gutter and a spike having a head thereon; said spike passing through the front wall of the gutter, through said tube and said rear wall and into the facia of a building to support said gutter thereon; and a metal strap having an opening adjacent the first end thereof which end is located adjacent the front wall of said gutter, said spike passing through said opening, said strap extending toward the roof of said building and having its second end secured to said roof; the improvement wherein the first end of said strap is located between the head of said spike and the outside of the front wall of said gutter and wherein said strap is bent at an angle of approximately 180° at a point near said opening but on the side of said opening away from said first end so that a portion of said strap after the bend overlies the head of said spike to lock the same in place.

4,433,513

STORAGE AND SHIPPING UNIT

William A. Latimer, 2523 Meadow La., Topeka, Kans. 66614

Filed Aug. 13, 1982, Ser. No. 408,023
Int. Cl.³ A47B *5/00*
U.S. Cl. 52—36 **10 Claims**



1. For shipping and storage of goods,

a transportable, walk-in container having top, bottom and upstanding walls;

an access door in one of said walls;

a series of parallel rows of elongated, spaced apart, parallel uprights in said container,

said rows being equally spaced, presenting a number of walk-through passages therebetween;

a stack of spaced, superimposed receptacles in each passage respectively,

each receptacle being adapted to receive a quantity of said goods;

releasable means attaching the receptacles to proximal uprights,

said container having a rear section and a front section;

an upper and a lower support in the container; and

a number of fasteners extending through the top wall, the supports and the bottom wall for holding the sections in abutting relationship, the uprights spanning the distance between the supports, each fastener having an upright in surrounding relationship thereto.

4,433,514

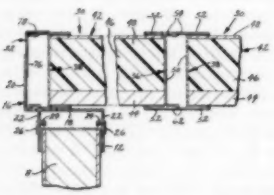
CEILING SYSTEM FOR SMALL BUILDINGS

J. Gordon Henges, Jr., St. Louis County, and Steve W. Schulte, St. Charles, both of Mo., assignors to J Henges Enterprises, Inc., Earth City, Mo.

Filed May 19, 1982, Ser. No. 379,628

Int. Cl.³ E04C 1/10

U.S. Cl. 52—94 11 Claims



1. In a building having spaced apart side walls and spaced apart end walls that are joined to the side walls at corners, an improved ceiling system for closing the top of the building, said ceiling system comprising: ceiling caps fitted over the upper ends of at least the side walls, with each cap having a horizontal section and a vertical section that projects upwardly from the horizontal section, the vertical sections being presented outwardly from their respective horizontal sections so that the horizontal sections are located closest to the space between the side walls; and a plurality of rectangular ceiling panels, each extending from the ceiling cap on one side wall to the ceiling cap on the other side wall so as to bridge the space between the side walls, each panel having a first connecting section along one of its sides, a second connecting section along its other side and a filler member between the first and second connecting sections, each panel at one of its ends resting on the horizontal section of the ceiling cap for one side wall and at its other end resting on the horizontal section of the ceiling cap for the other side wall, whereby the vertical sections of the ceiling caps at least in part obscure the ends of the ceiling panels, the ceiling panels being arranged such that as to adjacent panels the first connecting section of the one panel is adjacent to the second connecting section of the other panel, the first and second connecting sections on adjacent panels being snapped together and positively interlocked such that the adjacent panels where they are interlocked cannot be displaced upwardly or downwardly with respect to each other.

4,433,515

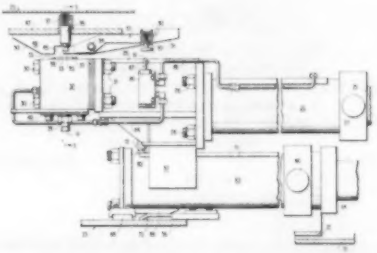
REMOTELY OPERABLE LATCH AND LOCKING PIN FOR A MULTI-SECTION BOOM INCLUDING A MANUAL FLY SECTION

William R. Mentzer, Shady Grove, and Vincent Bernabe, Jr., Newville, both of Pa., assignors to Kidde, Inc., Saddle Brook, N.J.

Filed Nov. 4, 1981, Ser. No. 318,039

Int. Cl.³ B66C 23/06

U.S. Cl. 52—115 12 Claims



1. In a telescoping boom which includes a base section and a manual fly section, a first extension and retraction power means connected between the base section and one telescoping section of the boom and extending into the interior of the manual fly section, a first latching element on said first power means, a second latching element on the manual fly section adapted to engage automatically with the first latching element responsive to extension or retraction of the manual fly section relative to the first power means, a second extension and retraction power means connected between two telescoping sections of the boom, a locking pin for the manual fly section on the telescoping section which immediately surrounds the manual fly section, the manual fly section having a coacting receiver for the locking pin with which the locking pin engages automatically responsive to relative movement between the manual fly section and the telescoping section immediately surrounding it, and remote power means for selectively disengaging the latching element on the first power means from the second latching element while the locking pin is engaged with said receiver and vice-versa, said remote power means including a pressure fluid circuit forming a safety interlock between the first latching element and locking pin assuring that one will be engaged while the other is disengaged in the use of the manual fly section, said first latching element comprising an element yieldingly biased toward engagement with the second latching element and said locking pin being yieldingly biased toward engagement with said receiver, said pressure fluid circuit including means to cause selective disengagement of the first latching element and locking pin from the second latching element and said receiver respectively, and spaced actuator elements on said second extension and retraction power means, and a check valve forming part of the fluid circuit having an actuator in the path of movement of the spaced actuator elements and controlling the disengagement of said first latching element from the second latching element.

4,433,516

WALL PANEL ALIGNMENT SYSTEM

Siegfried Fricker, Wurmbergerstrasse 30-34, 7135 Wiernsheim, Fed. Rep. of Germany

Filed Sep. 2, 1981, Ser. No. 298,723

Claims priority, application Fed. Rep. of Germany, Sep. 2, 1980, 3032930

Int. Cl.³ E04D 15/00

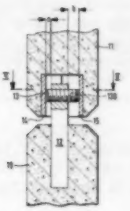
U.S. Cl. 52—126.3 5 Claims

1. A system for the alignment of the surfaces of two adjacent wall panels in a common plane, with freedom for relative displacement of the panels in said alignment plane, the system

being particularly suited for use in conjunction with concrete wall panels which are mounted on the face of a building, the wall panel alignment system comprising in combination:

an alignment mortise in the end face of a first one of the two wall panels, the mortise being in the form of a recess, having two opposing longitudinal walls which are parallel to the alignment plane;

an alignment stake which is fixedly attached to the second wall panel, having an end portion extending a distance into the mortise recess in such a way that it is surrounded by the latter without touching its walls; and



an alignment member which is attached to the mortise-surrounded end portion of the alignment stake, in an orientation which is transverse to the parallel walls of the mortise recess; and wherein

the alignment member fits between the parallel walls of the mortise recess with minimal displacement clearance at two opposing contact points; and

the alignment member is attached to the alignment stake in such a way that the portion of its contact points with the walls of the mortise recess in relation to the alignment stake is adjustable in a direction which is transverse to the alignment plane.

4,433,517

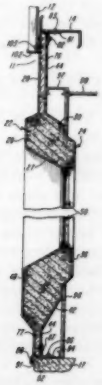
WINDOW ASSEMBLY

Franklin Moore, Jr., 902 McBurney Dr., Lebanon, Ohio 45036

Filed Jan. 11, 1982, Ser. No. 338,423

Int. Cl.³ E06B *3/20*

U.S. Cl. 52—204 **11 Claims**



1. A window assembly adapted for mounting within an opening in a wall panel of a building, comprising an inner shell of molded rigid plastics material, an outer shell of molded rigid plastics material and mating with said inner shell, said inner and outer shells disposed in opposing relation and having means defining a window opening, means for securing a transparent window panel within said window opening, said inner and outer shells including corresponding generally rectangular frame-like trim portions surrounding said window panel, said inner and outer shells further including corresponding substantially flat and parallel spaced opposing border portions extending around said trim portions, substantially rigid spacer means disposed between said opposing border portions of said inner and outer shells, said trim portions being contoured and projecting outwardly from the planes of the corresponding said border portions in opposite directions to define a cavity therebetween, insulation means disposed within said cavity between said opposing trim portions of said inner and outer shells, and means connecting said inner and outer shells with said spacer means confined between said border portions.

4,433,518

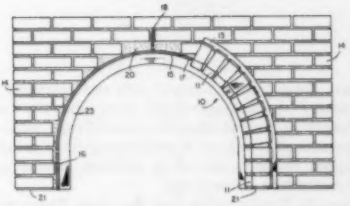
WALL STRUCTURE OPENING OF MASONRY AND PRE-CAST FACADE

Steven G. Rice, R.R. 2, Catlettsburg, Ky. 41129

Continuation-in-part of Ser. No. 123,813, Jan. 10, 1980, abandoned. This application Jul. 17, 1981, Ser. No. 284,481

Int. Cl.³ E06B *1/04*

U.S. Cl. 52—211 **6 Claims**



1. Wall structure consisting essentially of masonry and in part defining an opening wherein the portion of solid elements of masonry generally forming the opening need not be individually configured and disposed to necessarily provide an esthetic alignment of end pieces thereof as is requisite in conventional masonry structure; the wall structure comprising:

a vertically disposed cast plate generally conforming to the vertical extent at such opening and having at least a first portion overlying such opening to thereby cover said portion of solid elements;

a second cast plate integral with and extending co-extensively and transversely from the vertically disposed plate;

the second plate generally conforming to said opening and closely underlying and covering the underside of said portion of solid elements;

a mortar, or the like fill between said second plate and said portion of solid elements to thereby provide a unitary wall structure including said masonry and the facade means comprising said cast plates; and

means integral with at least one of the plate structures and secured to said masonry;

whereby incorporation of the facade means into the wall structure allows for masonry construction of said opening but without said conventional requisite configuration and alignment of masonry end pieces to thereby expedite overall construction.

4,433,519

SIMULATED LOG CONSTRUCTION ELEMENT

Thomas A. Jenkins, Box 502, Bismarck, N. Dak. 58502

Filed May 26, 1981, Ser. No. 266,668

Int. Cl.³ E04B *1/10, 1/74;* E04C *1/10*

U.S. Cl. 52—233 **13 Claims**

1. A construction unit comprising:

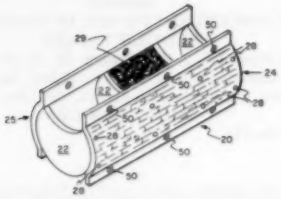
a plurality of prefabricated modular construction elements

positioned adjacent one another in stacked parallel relation, each construction element comprising:

a plurality of longitudinally spaced supports, each support having a top, a bottom, a first convex curved side, and a second side opposite the first side, the tops of the supports of one modular construction element being located to be adjacent the bottoms of the supports of a modular construction element stacked above;

rigid sheath means at least partially enclosing and attached to the supports to form an at least partially circular and generally rigid hollow cylinder capable of independently bearing structural weight;

upper flange means integral with and extending upward from the sheath means along generally the entire length of the cylinder; and



lower flange means integral with and extending downward from the sheath means along generally the entire length of the cylinder, the lower flange means being positioned to engage in overlapping relationship to the upper flange means of an adjacent parallel modular construction element; and

means for fixedly connecting the upper flange means of one modular construction element with the lower flange means of an adjacent modular construction element stacked above so that the supports of the stacked elements are aligned in stacked relation to provide vertical strength and the sheath means of the stacked elements are attached together to form a rigid wall.

4,433,520

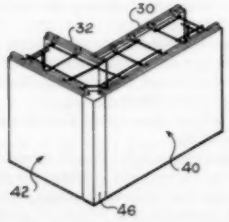
BUILDING WALL CONSTRUCTION

Jack Maschhoff, 328 W. Harrison, Royal Oak, Mich. 48067

Filed Dec. 15, 1980, Ser. No. 216,527

Int. Cl.³ E04B *2/32*

U.S. Cl. 52—275 **9 Claims**



1. A corner construction for a self-supporting building structure module for a building wall construction utilizing spaced outside and inside panels maintained in spaced relation by rigid spacer means spanning the space between the panels, said corner construction being assembled and retained in assembly without adhesives or cement and which comprises:

(a) one or more pairs of outside panels disposed with vertical edges in spaced relation and in planes at a predetermined corner angle and having tongue projections on the spaced edges,

(b) one or more pairs of inside panels disposed in planes at the same predetermined corner angle as the outside panels,

(c) one or more L-shaped substantially rigid spacer frames having legs disposed relative to each other at said corner angle and having portions to interfit with and tie together horizontal edges of said pairs of inside and outside panels to maintain said panels at said corner angle and in spaced relation, and

(d) a first corner interlock post unconnected to an independent of said rigid spacer means having opposed grooves to receive respectively said tongues on said outside panels and dimensioned laterally to be driven endwise into the space between said spaced vertical edges of said outside panels to rigidify the corner module.

4,433,521

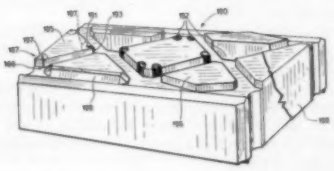
BUILDING COMPONENT, METHOD OF CONSTRUCTION AND WALL FORMED THEREBY

Rodney J. P. Dietrich, 51 Trailridge Cres., Pent #3, West Hill, Ontario, Canada

Filed May 30, 1980, Ser. No. 154,927

Int. Cl.³ E04C *1/16, 1/40, 2/26*

U.S. Cl. 52—302 **1 Claim**



1. A building component comprising:

a body portion defining top and bottom surfaces, interior and exterior wall surfaces, and end surfaces adapted for abutting engagement in rows of a wall to formed with multiple building components;

at least one vertical opening formed in said body, said opening including insulating material which protrudes by a predetermined amount from at least one of said top and bottom surfaces of said body and is adapted to engage the opposing surface of the overlying or underlying components;

fluid bonding material containment ridges formed on the top and bottom surfaces;

fluid bonding material flow canals defined by said containment ridges and the borders of said protruding insulating;

at least one vertical core which, when multiple building components are assembled to form a wall in a designed overlapping manner, will align with vertical cores in underlying and overlying components to define a vertical path throughout the height of the wall;

said vertical path communicating with said canals and being adapted to receive fluid bonding material;

whereby fluid bonding material may be introduced into said vertical path into communication with said canals to fill said canals with a desired volume of bonding material at the interface between the adjoining rows of building components in a wall;

wherein said vertical opening and insulation material therein define a vertical air relief passageway open to the border of the protruding insulation adjacent one of the canals;

wherein said vertical opening, insulation material located therein, and the vertical passageway are adapted, respectively, to align with the vertical openings, insulation material, and vertical passageways in underlying and overlying components to form, respectively, vertical continuous

vertical openings, insulation material, and vertical passageways; and

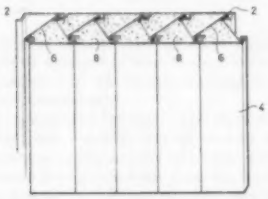
screen means disposed between said one canal and the vertical passageway to substantially prevent flow of fluid bonding material into the vertical passageway from said one canal.

4,433,522

BLAST AND FRAGMENT-RESISTANT PROTECTIVE WALL STRUCTURE

Yaakov Yerushalmi, Petach Tikva, Israel, assignor to Koor Metals Ltd., Bat-Yam, Israel

Filed Apr. 3, 1981, Ser. No. 250,578
Claims priority, application Israel, Apr. 13, 1980, 59817
Int. Cl.³ E04B 2/32, 2/86
U.S. Cl. 52—426 10 Claims



1. A protective wall structure having a high resistance to blast and fragments, characterized in that it includes;

two spaced groups of panels of rigid metal sheets, the sheets of each group having ends in interlocking relationship with the ends of the adjacent sheets of the respective group and defining therewith each of the two opposite faces of the wall structure, the interlocking ends of one group of face panels being non-aligned with the interlocking ends of the other groups of face panels;

a plurality of diagonal panels of rigid metal sheets extending diagonally between the face panels and having ends in interlocking relationship with each of the interlocking ends of the face panels;

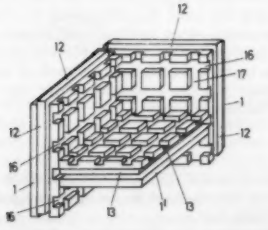
and a filling material filling the space between the face panels and embedding the diagonal panels therein.

4,433,523

BLOCK OR BRICK FOR THE CONSTRUCTION OF A TWO-SHELL TILE STOVE

Horst Miedaner, Guetratweg 10, and Herbert Spirk, Kühbergstr. 31, both of A-5020 Salzburg, Austria

PCT No. PCT/AT80/00037, § 371 Date Sep. 17, 1981, § 102(e) Date Sep. 17, 1981, PCT Pub. No. WO81/02192, PCT Pub. Date Aug. 6, 1981
PCT Filed Dec. 30, 1980, Ser. No. 306,612
Int. Cl.³ E04C 1/10
U.S. Cl. 52—592 7 Claims



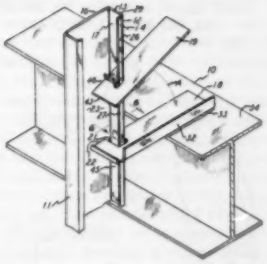
1. A refractory block for the construction of an internal shell structure of a two-shell tile stove having an external shell of tiles, said block comprising a generally rectangular parallelopipedly body of refractory material formed with a longitudinal center rib on each of two faces adapted to contact adjacent blocks, a corresponding longitudinal groove on each of the opposite faces of said block, at least one first lateral groove arranged on a first side face, at least one second lateral groove intersecting each first lateral groove at a right angle, each of said lateral grooves being identical to said longitudinal groove, and the marginal distance of the respective first and second lateral grooves corresponding to the marginal distance of said longitudinal groove, and a second side face which is closed, planar and free from discontinuities.

4,433,524

METHOD AND APPARATUS FOR SLIP-CONNECTOR STRUCTURAL JOINT

John S. Matson, Racine, Wis., assignor to Nostam, Inc., Racine, Wis.

Filed Jun. 19, 1981, Ser. No. 275,295
Int. Cl.³ E04B 1/18
U.S. Cl. 52—665 5 Claims



1. A slip-connector for a structural joint between a steel beam and a C-shaped steel stud having a channel-shaped side portion, comprising a first steel plate having an opening in the edge thereof receiving the stud side portion to restrict lateral movement of the stud while allowing longitudinal movement of the stud, said first plate having a portion projecting from the stud and onto the beam and with the projecting portion connected to the beam, a second steel plate having an opening in the edge thereof receiving the stud side portion and being offset with said first plate opening for further restricting lateral movement of the stud and with said second plate being connected to said first plate.

4,433,525

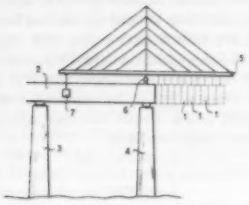
METHOD AND A DEVICE FOR EXTENDING THE DECK OF A BRIDGE OR SIMILAR STRUCTURES, WITH DESK SEGMENTS, USING A CABLE STAYED BEAM

Pierre Richard, Neuilly sur Seine, France, assignor to Bouygues, Clamart, France

Filed Nov. 23, 1981, Ser. No. 324,016
Claims priority, application France, Nov. 25, 1980, 80 24985
Int. Cl.³ E04G 21/00; E01D 21/04
U.S. Cl. 52—741 8 Claims

1. A method of positioning deck segments in the extension of a portion of a deck of a bridge or similar structure using a cable stayed beam resting on a rear support and on a hinged front support, which comprises a first phase during which the overhanging segments are suspended from said beam and the part of the beam which is in front of the front support is maintained substantially steady, and which comprises a second phase, during which the segments are joined to said portion by producing a prestress in the segments and in said portion, and the weight of the segments is progressively transferred to said

portion substantially simultaneously with the application of the prestress, which is obtained by progressively allowing the said



rear part of the beam to swing around the front support during said second phase.

4,433,526

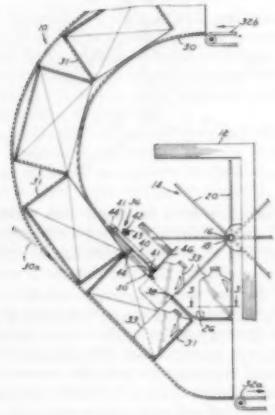
PACKAGING MACHINE

Keith W. Nord, Stillwater, Minn., assignor to Ex-Cell-O Corporation, Troy, Mich.

Filed Apr. 8, 1981, Ser. No. 252,092

Int. Cl.³ B65B *5/08, 21/14*

U.S. Cl. 53—244 **6 Claims**



1. A case loading machine comprising a frame, a spider mechanism rotatably mounted on a shaft having the ends thereof supported on said frame and including radially extending shelves for transporting in a circular path containers to be loaded into cases with each shelf carrying one or more containers, a guide plate secured to said frame adjacent a predetermined circumferential portion of the circular path swept-out by said shelves wherein said guide plate supports said containers being transported by said shelves, a chute having an elongated passage for conveying cases past said guide plate, an opening formed through a wall of said chute adjacent said guide plate for communication with the open tops of the cases, a stop mechanism including means rotatably mounted on said frame, said shaft means having a predetermined number of fingers extending radially therefrom in different radial directions and longitudinally spaced along the length of said chute, wherein certain ones of said fingers extend into the path of movement of said cases for alternately engaging said cases and thereby controlling the movement of the cases past said opening, means for rotating said shaft means such that said case are controlled by said fingers to advance in repeated movements each equal to the distance of the width of one row of containers, and electrical means for coordinating the movements of the stop mechanism and the spider mechanism whereby successive layers of one or more containers are fed from the respective shelves of the spider mechanism as such respective shelves pass by said opening into the space of the next available row within the respective cases as said stop mechanism permits each case to drop under the force of gravity the distance of one container row width.

4,433,527

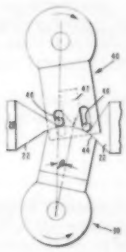
HEAT SEALING FILM CUT-OFF DEVICE

Harold E. Ramsey, Wilmington, and Edward E. Fischer, Newark, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 19, 1981, Ser. No. 294,364

Int. Cl.³ B65B *9/12;* **B30B** *5/02*

U.S. Cl. 53—548 **10 Claims**



1. A heat seal and cut-off device for packaging articles in tubular thermoplastic comprising:

(a) an anvil assembly rotatable about a first rotational axis and having a resilient anvil surface spaced apart from the first rotational axis;

(b) a knife and clamping assembly rotatable about a second rotational axis parallel with the first rotational axis and having

(i) a knife with a knife edge and heating means therein fixedly mounted on the assembly parallel with the rotational axis, the knife being directed away from the second rotational axis with the knife edge spaced a minimum distance from the first rotational axis which is less than the distance of the resilient anvil surface from the first rotational axis;

(ii) a pair of clamping bars individually mounted on the assembly, one on either side of and parallel with the knife edge, means for mounting said clamping bars for independent movement, and biasing means against each clamping bar for independently urging each of the bars, in extended position out of contact with the anvil surface, a distance from the second rotational axis which is more than the distance of the knife edge from the second rotational axis and, independently urging each of the bars, in a position in contact with the anvil surface, against the resilient anvil surface whereby, when said knife and clamping assembly and said anvil assembly are rotated in one rotational direction so as to move synchronously, each of the clamping bars contact the anvil surface before the knife edge contacts the anvil surface.

4,433,528

METAL DETECTOR APPARATUS

Carl E. Bohman, New Holland, Pa., assignor to Sperry Corporation, New Holland, Pa.

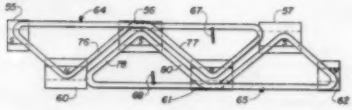
Filed Aug. 30, 1982, Ser. No. 413,113

Int. Cl.³ A01D *75/18*

U.S. Cl. 56—10.2 **6 Claims**

1. In a metal detector for protecting rotatable machine elements in harvesting machines, having means for generating a

magnetic field comprising flux lines in a material flow path, the flux lines of said field being in a series of regions, the lines of adjacent regions being other than parallel to each other, said generating means comprising two sets of magnet members, one set of said magnet members having a first polarity and being in a first row, another set of said magnet members of the opposite polarity being in a second row, said rows being generally tranverse to the material flow path and said magnet members of said first row being in staggered relationship with the magnet members of the second row, sensing means in which an electrical signal is induced when the magnetic field is altered



by the presence of metallic material, and a signal processor to initiate a control sequence to limit damage to the said elements when the presence of undesirable material is detected, the improvement comprising,

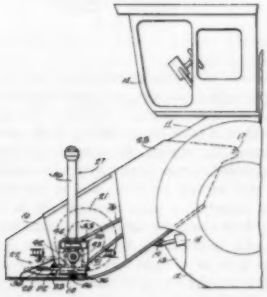
said sensing means comprising a coil having a plurality of windings, said windings having at least two generally equal portions, and means for mounting said coil such that one of said portions extends from the vicinity of a first magnet member in said one set to the vicinity of a second magnet in said another set, and the second of said portions extends from the vicinity of said first magnet to the vicinity of a third magnet in said another set.

4,433,529

TORSION SPRING COUPLED DRIVE MECHANISM FOR RECIPROCATING DEVICE HAVING HAZARD WARNING MEANS

Warren E. Herwig, Wind Lake; Tony L. Kaminski, Greendale, and Paul T. Shupert, Milwaukee, all of Wis., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Sep. 30, 1982, Ser. No. 430,015
Int. Cl.³ A01D *35/02, 75/20*
U.S. Cl. 56—10.2 **17 Claims**



1. An apparatus having a reciprocable operating member, drive means for reciprocating said operating member,

torsion spring means operatively connected to said drive means and to said operating member end having a neutral position with minimum energy stored therein when said operating member is at the midpoint of its reciprocation and being loaded to store energy therein when said operating member is actuated in either direction away from said midpoint, and

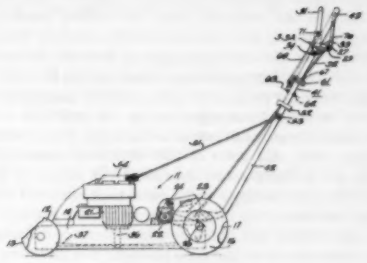
means for providing an alarm when said drive means is shut off while energy is still stored in said torsion spring means.

4,433,530

INTERLOCK MECHANISM PREVENTING ENGINE STARTING WHEN A MOWER IS IN POWER DRIVE

Daniel W. Schaefer, Port Washington, Wis., assignor to Simplicity Manufacturing, Inc., Port Washington, Wis.

Filed Sep. 23, 1982, Ser. No. 422,152
Int. Cl.³ A01D *69/08, 53/08*
U.S. Cl. 56—11.8 **9 Claims**



1. In a wheeled vehicle having at least one drive wheel, an internal combustion engine with a pull type starting mechanism and a drive train connecting the engine to the drive wheel including a clutch device having drive establishing and drive disestablishing conditions, the combination comprising:

a manually operated pull cable connected at one of its ends to said starting mechanism and having a hand grip on its other end, said hand grip being in a predetermined position when said pull cable is not being operated,

a control for said clutch device by which the vehicle operator selectively causes said clutch device to be in its drive establishing and drive disestablishing conditions,

a blocking member mouted on said vehicle near said pull cable grip shiftable between a release position in which manual gripping and pulling of said grip is unhindered by said blocking member and a blocking position in which manual gripping and pulling of said grip is hindered by said blocking member, and

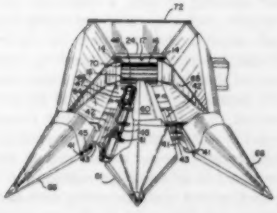
means causing said blocking member to occupy its release position when said clutch device is in its drive disestablishing condition and to occupy its blocking position when said clutch device is in its drive establishing condition.

4,433,531

FORAGE HARVESTER CORN SNAPPING HEADER

Elmer M. Kesl, Downers Grove; Thomas J. Scarnato, Barrington, and Peter Sammarco, Downers Grove, all of Ill., assignors to International Harvester Co., Chicago, Ill.

Filed Aug. 6, 1979, Ser. No. 64,146
Int. Cl.³ A01D *45/02*
U.S. Cl. 56—106 **4 Claims**



1. A forage harvester having a mobile frame, a crop infeed housing having a crop inlet and a plurality of transversely extending crop infeed rolls thereinside and a corn snapping

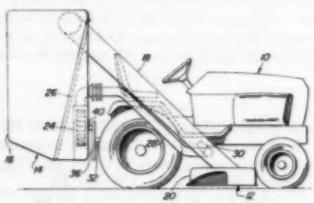
header for harvesting ears of corn from rows of standing stalks attached to said mobile frame forwardly of said housing inlet, said corn snapping unit comprising a header frame assembly, left and right corn snapping units attached to said header frame assembly and extending downwardly forwardly, each of said snapping units having a crop passage defined by a pair of parallelly disposed snapping plates and including a pair of cooperative counterrotating snapping rolls disposed in longitudinal parallel relationship respectively adjacent said crop passage beneath said snapping plates for pulling standing corn stalks downwardly through said snapping plates to remove the ears therefrom, the transverse spacing between forward stalk entry ends of said crop passages being greater than the width of said forage harvester crop inlet, a central divider structure disposed between the snapping units, left and right outer divider structures attached respectively to the outer sides of said snapping units, said outer divider structures extending rearwardly and partially across the rear of said header to define a single rear outlet having a width equal to or narrower than said forage harvester crop inlet and in transverse registry therewith, said central and outer divider structures defining rearward continuations of said crop passages, and gathering means disposed alongside said crop passages and extending to rear ends adjacent said feed rolls, said snapping unit being characterized in that the snapping unit passages and snapping rolls are disposed at an angle to the path of travel of the forage harvester and converge toward said single rear outlet.

4,433,532

LAWN MOWER BAGGING SYSTEM INCLUDING AIR ASSIST

Myron L. McCuna, Orion, Ill., assignor to Deere & Company, Moline, Ill.

Filed Jul. 29, 1982, Ser. No. 403,176
Int. Cl.³ A01D *35/22*
U.S. Cl. 56—320.2 **5 Claims**



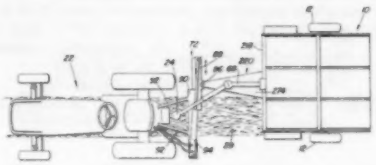
1. In combination with a bagging lawn mower including a mower blade housing defining a discharge opening, an enclosed receptacle, and a material-conveying conduit having opposite ends respectively connected for receiving material from the discharge opening and depositing material into an upper portion of the receptacle, an air assist system comprising: a blower means having an inlet and an outlet; said inlet being connected to a lower area of the receptacle; screen means mounted in said receptacle for preventing material from being ingested by said blower means; and an air duct having one end connected in air-receiving relationship to said outlet and having another end communicating with said conduit at a location downstream from said discharge opening, with said last-mentioned end being in the form of a nozzle oriented to direct a stream of relatively high velocity air in the direction of said receptacle whereby an area of low pressure is caused for inducing air from the blade housing.

4,433,533

CYLINDRICAL BALER WITH AUTOMATIC STEERING SYSTEM

Angel Giani, Gray-la-Ville, France, assignor to Deere & Company, Moline, Ill.

Filed Mar. 25, 1982, Ser. No. 361,948
Claims priority, application European Pat. Off., Mar. 25, 1981, 81400477
Int. Cl.³ A01D *39/00*
U.S. Cl. 56—341 **17 Claims**



1. In a baler comprising a main frame, a chamber in said frame for the formation of a cylindrical bale from a crop, an opening leading into the said chamber, and a pickup for transferring the crop from a windrow to this opening, the improvement comprising detecting means for detecting the nonuniformity of the diameter of a bale in said chamber, and steering means disposed in front of said pickup responsive to said detecting means for causing said frame to be laterally displaced relative to said windrow to maintain a uniform diameter of the bale during formation.

4,433,534

APPARATUS FOR SPLICING SPUN YARNS

Hiroshi Mima, Kyoto, Japan, assignor to Murata Kikai Kabushiki Kaisha, Japan

Filed Aug. 26, 1981, Ser. No. 296,448
Claims priority, application Japan, Aug. 26, 1980, 55-118078
Int. Cl.³ D01H *15/00*
U.S. Cl. 57—22 **7 Claims**

1. A pneumatic yarn splicing apparatus for spun yarns which includes yarn-cutting devices, yarn end control nozzles and a yarn-splicing member arranged between the control nozzles and is located at a position deviating from an ordinary yarn path of an automatic winder, characterized in that a cylindrical yarn-splicing hole for insertion of a yarn end on the bobbin side and a yarn end on the package side is formed through the yarn-splicing member, a yarn-inserting slit is formed on the yarn-splicing hole along the longitudinal direction thereof, and a flat jet nozzle intersecting the lengthwise direction of the yarn-splicing hole at a right angle and having a section of which width is smaller than ½ of the diameter of the yarn-splicing hole and of which length is larger than said width is tangentially opened on the yarn splicing hole.

4,433,535

GLASS FIBRE YARNS AND OTHER GOODS, AND METHOD OF MANUFACTURE

Louis D. Darrichard, Conde sur Noireau, and Jacques Plaisant, Flers, both of France, assignors to Valeo, Paris, France

Filed Dec. 29, 1981, Ser. No. 335,328
Claims priority, application France, Dec. 31, 1980, 80 27913
Int. Cl.³ D02G *3/18, 3/12*
U.S. Cl. 57—229 **13 Claims**

1. A textile yarn, comprising a mixture of short glass fibres

and short support fibres which are carded and then spun, the diameter of said glass fibres being from about 4 microns to about 20 microns, and the fineness of the support fibres being from about 1.4 decitex to about 15 decitex.

4,433,536

SPIRAL WRAPPED SYNTHETIC TWINE AND METHOD OF MANUFACTURING SAME

John B. O'Neil, Summerville, S.C., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Sep. 23, 1981, Ser. No. 304,718
Int. Cl.³ D02G *3/06, 3/36, 3/40, 3/44*
U.S. Cl. 57—233 **33 Claims**

1. A tying twine comprising:
at least one longitudinally extending oriented synthetic ribbon which has zero twist and has been slit fibrillated to provide a substantially ordered net-like structure having fine fibril stems connected by finer fibril branches; and
a synthetic binder in thin band form spirally wound around and adhered to said at least one synthetic ribbon to form longitudinally spaced spirals.

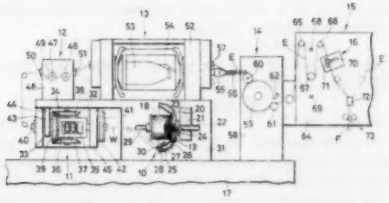
13. A method of making a tying twine comprising of steps:
providing at least one longitudinally extending synthetic ribbon;
orienting said at least one synthetic ribbon along the longitudinal length thereof;
slit fibrillating said at least one synthetic ribbon to provide a substantially ordered net-like structure having fine fibril stems connected by finer fibril branches; and
thereafter spirally wrapping and adhering a synthetic binder in thin band form around said at least one synthetic ribbon which has zero twist and has been oriented and fibrillated to form a twine bound by longitudinally spaced spirals.

4,433,537

METHOD OF MANUFACTURING A ROW OF CONTINUOUS COUPLING ELEMENTS FOR SLIDE FASTENERS

Fumiaki Yokoi, Uozu, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed May 18, 1982, Ser. No. 379,290
Claims priority, application Japan, May 22, 1981, 56-77560
Int. Cl.³ D01H *13/26, 13/32;* **B29C** *17/02;* **B29D** *5/00*
U.S. Cl. 57—264 **2 Claims**



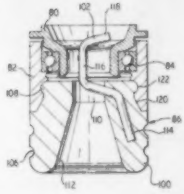
1. A method of manufacturing a row of continuous coupling elements of thermoplastic filamentary material, comprising the steps of:
(a) forming the thermoplastic filamentary material into the row of continuous coupling elements;
(b) measuring a dimension of one of the continuous coupling elements as formed;
(c) comparing the measured dimension with a reference value to detect a dimensional error, if any, of the measured one of the continuous coupling elements; and
(d) adjustably controlling the tensioning of the thermoplastic filamentary material prior to the latter's being formed into the row of continuous coupling elements on the basis of said dimensional error so as to remove the dimensional error from subsequently formed coupling elements.

4,433,538

TEXTILE SPINNING MACHINES

John F. Graham, 33 Dudley Dr., Hyndland, Glasgow, Scotland

Filed Apr. 13, 1981, Ser. No. 253,397
Claims priority, application United Kingdom, Apr. 17, 1980, 8012722; Apr. 17, 1980, 8012723
Int. Cl.³ D01H *7/92, 13/10, 5/28*
U.S. Cl. 57—328 **10 Claims**



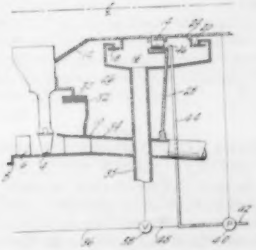
1. In a textile spinning machine a tension reliever comprising a drive wharf mounted for rotation about its own axis and a capstan device itself comprising a hollow body and a capstan element for a yarn, said capstan element being carried by said hollow body, said capstan device being releasably connected with said wharf in a manner such that it is supported for rotation with said wharf to cause rotation of said capstan element but can be completely and readily removed from said wharf for the purpose of threading-up the yarn through said capstan device and into engagement with said capstan element.

4,433,539

MEANS FOR CONTROLLING AIR SCAVENGE PRESSURE IN THE BEARING COMPARTMENT OF GAS TURBINES

James R. Norris, Bolton, and Harrison R. Picard, Granby, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed May 13, 1982, Ser. No. 377,746
Int. Cl.³ F02C *7/06*
U.S. Cl. 60—39.08 **5 Claims**



1. In a gas turbine having a rotor and a compressor discharge passage for compressor discharge air:
a bearing for the rotor;
a compartment surrounding the bearing;

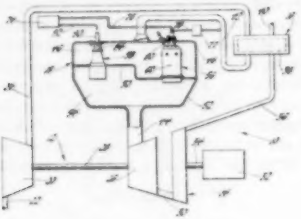
seals cooperating with the compartment to prevent leakage of oil from said compartment;
means for supplying compressor discharge air from said passage to said seals exteriorly of the compartments;
a vent duct for the compartment;
a restrictive valve in said duct by which to vary the discharge of air from said compartment; and
means responsive to rotor speed for actuating said restrictive valve.

4,433,540

LOW EMISSION COMBUSTOR

Walter Cornelius, Troy; Thomas P. Kosek, East Detroit, and Edward D. Klomp, Mt. Clemens, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jun. 7, 1982, Ser. No. 385,811
Int. Cl.³ F02C 7/105, 7/228
U.S. Cl. 60—39.511 **5 Claims**



1. In a gas turbine engine having a compressor, a turbine, a regenerator, and means for circulating turbine exhaust and compressor discharge through said regenerator whereby said compressor discharge is regeneratively heated to a temperature proportional to turbine exhaust temperature, the combination comprising, an inlet plenum maintained at compressor discharge pressure by said regenerated compressor discharge, a catalytic combustion chamber open to said inlet plenum and having a catalyst therein exposed to flow therethrough, said catalyst being operative at temperatures above a minimum temperature to sustain an ultra lean air/fuel ratio combustion reaction within said catalytic combustion chamber, a diffusion flame combustion chamber open to said inlet plenum, means defining a common exhaust plenum between each of said catalytic combustion and said diffusion flame combustion chambers and said turbine so that parallel flow paths are established whereby products of combustion developed in one of said catalytic combustion and said diffusion flame combustion chambers are diluted and cooled by regenerated compressor discharge flowing through the other, and fuel supply means operative in a first mode during engine start-up to meter fuel only to said diffusion flame combustion chamber and to effect ignition therein until said regenerated compressor discharge achieves a temperature corresponding to a temperature of said catalyst above said minimum temperature and thereafter in a second mode to meter fuel to only said catalytic combustion chamber for catalyst sustained combustion therein.

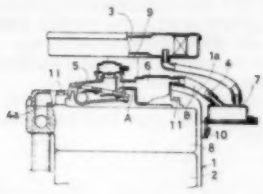
4,433,541

SECONDARY AIR INTRODUCING APPARATUS FOR INTERNAL COMBUSTION ENGINE

Katsuhisa Amano, Tokyo; Tadashi Kumagai, Tsurugashima; Akio Masaki, Oi; Shinichi Shimada, Kamifukuoka; Takeshi Suzuki, Asaka, and Shoichi Ohtaka, Oi, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 22, 1982, Ser. No. 390,831
Claims priority, application Japan, Jun. 24, 1981, 56-92402[U]
Int. Cl.³ F01N 3/30
U.S. Cl. 60—293 **3 Claims**

1. A secondary air introducing apparatus for an internal combustion engine, said engine including an engine body, an intake manifold, and an air cleaner provided on an upstream end portion of the intake manifold, said apparatus comprising a secondary air introducing passage connected between said air cleaner and said exhaust manifold, a check valve in said passage arranged to operate in response to pulsation pressure in



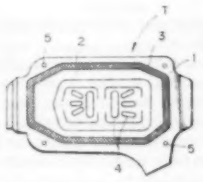
said exhaust manifold to supply clean secondary air thereto, a first expansion chamber interposed in said passage on an upstream side of said check valve, and a second expansion chamber interposed in said passage on an upstream side of said first chamber, at least said check valve and said first chamber being fixedly mounted on said intake manifold.

4,433,542

HEAT-SHIELDING STRUCTURE

Atsuo Shimura, Tokyo, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jul. 22, 1982, Ser. No. 401,018
Int. Cl.³ B60K 13/04
U.S. Cl. 60—299 **4 Claims**



1. A heat-shielding plate to be placed on a surface of automotive exhaust means, said heat-shielding plate having a fitting portion to be fixed to a portion of said exhaust means by bolt means, a heat-shielding plate body for covering said portion of said exhaust means, and a mesh portion disposed between said fitting portion and said heat-shielding plate body.

4,433,543

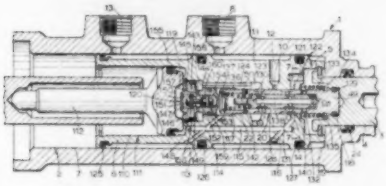
POWER-OPERATED BOOSTERS

Alfred W. Thomas, Koblenz, and Helmut Heibel, Moschheim, both of Fed. Rep. of Germany, assignors to Lucas Industries Limited, Birmingham, England

Filed Apr. 23, 1981, Ser. No. 256,778
Claims priority, application United Kingdom, Apr. 23, 1980, 8013427; Jan. 21, 1981, 8101762
Int. Cl.³ B60T 13/00
U.S. Cl. 60—547.1 **19 Claims**

1. A pedal-operated booster for a vehicle braking system, comprising a housing, means defining a bore in said housing, an inlet port for connection to a fluid pressure source, an exhaust port for connection to a reservoir for fluid, an input piston to which an input force is applied, an output member through which an output force acts, a boost piston for augmenting said output force working in said bore, means defining a boost chamber in said housing behind said boost piston, said boost piston being advanced in said bore in response to fluid pressure from said source pressurising said boost chamber, and control

valve means operative to control a supply of fluid from said source to said booster, said control valve means controlling pressurisation of said boost chamber in response to relative movement of said input piston and said boost piston, operation of said booster being in two stages, in a first stage, following small initial movement of said input piston in a brake-applying direction, said control valve means is operative to control said supply of fluid from said source to said booster to cause said output member to move through a limited distance independently of said input piston, and in a second stage, following further movement of said input piston in a brake-applying direction said control valve means is operative to control pressurisation of said boost chamber to cause continued movement of said output member in proportion to said further



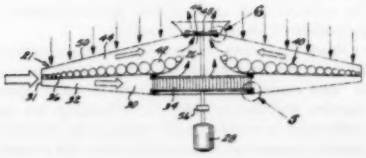
movement of said input piston, and said control valve means comprises relatively movable parts, said relatively movable parts including a control bore within said boost piston and a valve mechanism housed in said control bore, said valve mechanism having at least two valve parts, one of said valve parts being movable relative to said input piston, and having a pressure-responsive face, operation of said control valve means being dependent on pressure in said braking system, whereby in said first stage, said control valve means includes means whereby said braking system is pressurised to a threshold level by movement of said output member through an appropriate distance, and fluid pressure from said source is applied to said pressure-responsive face to move said one valve part relative to said input piston to place said boost chamber in communication with said inlet port.

4,433,544

WIND AND SOLAR POWERED TURBINE

Ivan D. Wells, Hesperia; Jin L. Koh, Loma Linda, and Marvin Holmes, Monrovia, all of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed May 19, 1982, Ser. No. 379,602
Int. Cl.³ F03G *7/02, 7/04;* **F01B** *21/04;* **F01K** *23/00*
U.S. Cl. 60—641.12 **20 Claims**



1. A combination wind and solar powered generating station to produce energy comprising:

a first plurality of radial air passage means adapted for receiving ambient wind, for providing a first source of air and for directing said air to a first predetermined location;

a second plurality of radial air passage means also adapted for receiving ambient wind for providing a second source of air and for directing said air to a second predetermined location;

means for collecting radiant solar energy in the form of thermal energy and for communicating said thermal energy with the second air passage means, thereby heating said air moving in the second plurality of air passage means;

first power means communicating with the first predetermined location for extracting energy from the first source of air, and

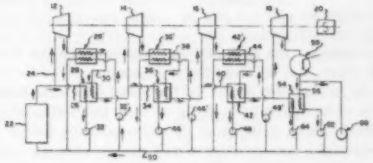
second power means communicating with the second predetermined location for extracting energy from the second source of air and also for extracting further energy from the first source of air.

4,433,545

THERMAL POWER PLANTS AND HEAT EXCHANGERS FOR USE THEREWITH

Yan P. Chang, 181 Sherbrooke Ave., Williamsville, N.Y. 14221

Filed Jul. 19, 1982, Ser. No. 399,463
Int. Cl.³ F01K *7/34*
U.S. Cl. 60—678 **14 Claims**



1. A thermal power plant for reducing exhaust heat and increasing thermal efficiency, comprising:

a source of working fluid;

a plurality of interconnected sequentially arranged fluid motor stages;

a supply conduit for supplying working fluid from said source to the inlet of the first of said stages;

a conduit from the outlet of the first of said stages for supplying working fluid to the second of said stages;

additional conduits from the outlet of the second of said stages and from the outlets of each subsequent downstream stage for separately supplying working fluid to the inlet of the next successive downstream stage;

a plurality of heat exchangers located between said stages for separately extracting heat from the inlet of the immediate upstream stage and separately applying the same to the inlet of the next successive downstream stage; and

each heat exchanger having at least a pair of inlets and at least a pair of outlets with one of said inlets and one of said outlets being in common fluid communication and in fluid communication, respectively, with the outlet of the immediate upstream stage and with the inlet of the next successive downstream stage, with the other of said inlets being in fluid communication with the inlet of the immediate upstream stage.

4,433,546

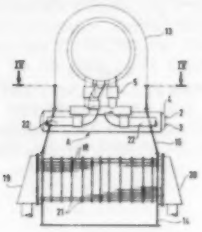
HEATER UNIT FOR HEATING WATER TO BE SUPPLIED TO A BOILER AND A WATER HEATER

Bernard Andrieux, Boulogne, France, assignor to Societe Anonyme dite: Delas-Weir, Levallois-Perret, France

Filed Feb. 5, 1982, Ser. No. 346,332
Claims priority, application France, Feb. 6, 1981, 81 02382
Int. Cl.³ F01K *9/00*
U.S. Cl. 60—691 **6 Claims**

1. A heater unit for heating water which is supplied to a steam-generating boiler of an electric energy production installation, said installation including an alternator driven by a

turbine having at least one low-pressure body connected by a housing to a steam condenser situated under said low-pressure body, said heater unit comprising a nest of tubes located inside said housing and being supplied with water coming from an extraction circuit for the condenser and the outer surface of the tubes being supplied with steam drawn off from the low-pressure body, the nest of tubes being substantially horizontal and perpendicular to the axis of the turbine, the cross-section of said nest of tubes of said heater unit being narrow and elongate with the elongate being disposed substantially vertically, the nest of tubes being enclosed in a casing which both channels



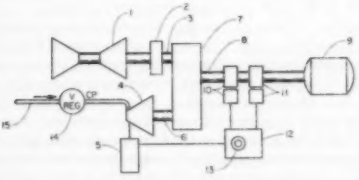
the steam around the nest of tubes and receives the steam bleed-off pipes, and wherein the cross-section of said casing has, in the connection region of the bleed-off steam supply pipes, one of its sides which, going up from the bottom slopes progressively away, going from the corresponding one of the two substantially vertical sides of said narrow elongate cross-section of said nest of tubes and, beyond said region, a cross-section which, while leaving a space for steam to pass, follows the profile of the contour of the cross-section of the nest of tubes, and means for supplying steam from above said casing via said pipes.

4,433,547

TORQUE LEVELLER

Joseph C. Firey, P.O. Box 15514, Seattle, Wash. 98115

Filed Jul. 30, 1982, Ser. No. 403,923
Int. Cl.³ F01B *21/04*
U.S. Cl. 60—711 **19 Claims**



1. An engine governor machine for governing two or more engines, all of which are coupled to a single common power output shaft, said governor comprising:

torque regulator means for regulating the torque output of at least one of said engines;

means for sensing the torque in said common final power output shaft;

means for sensing the speed of said common final power output shaft;

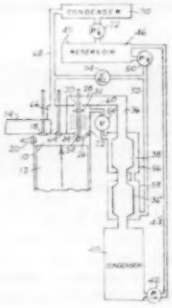
control means responsive to said torque sensor means and to said speed sensor means and operative upon said torque regulator means so that the torque in said common final output shaft is essentially steady as between successive cycles and is adequate to maintain the speed of said common final output shaft essentially constant.

4,433,548

COMBINATION INTERNAL COMBUSTION AND STEAM ENGINE

Olof A. Hallstrom, Jr., 1920 Hallstrom Rd., Tillamook, Oreg. 97141

Continuation of Ser. No. 227,967, Jan. 23, 1981, abandoned. This application May 27, 1982, Ser. No. 382,702
Int. Cl.³ F01K *27/00*
U.S. Cl. 60—712 **11 Claims**



1. A combination internal combustion and steam engine, comprising:

(a) a housing having therein at least one hollow cylinder containing a piston reciprocative therein,

(b) means for introducing combustible fuel into the cylinder to provide a combustible fuel power stroke for the piston,

(c) an exhaust passageway for exhausting hot gases of combustion from the cylinder after the combustible fuel power stroke,

(d) a steam generating chamber in the housing communicating at one location with the cylinder and at another location with the exhaust passageway, whereby hot gases of combustion in the cylinder are caused to pass through and heat the surfaces of the steam generating chamber on their way to the exhaust passageway,

(e) a source of water communicating with the steam generating chamber for supplying water to said chamber for conversion into steam by transfer of heat to the water from the hot surfaces of the chamber,

(f) an exhaust valve between the steam generating chamber and exhaust passageway operable to open communication between the steam generating chamber and the exhaust passageway for exhausting hot gases of combustion from the cylinder and to close said communication during generation of steam in the chamber,

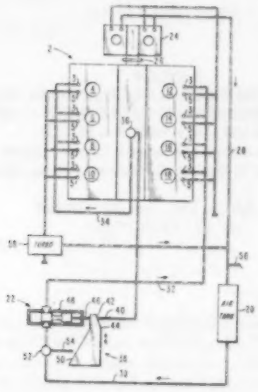
(g) a steam inlet valve between the steam generating chamber and cylinder operable when the exhaust valve is open to open communication between the steam generating chamber and the cylinder for exhausting hot gases of combustion from the cylinder through the chamber to the exhaust passageway, and operable when the exhaust valve is closed to open communication between the steam generating chamber and cylinder for introducing steam from the chamber to the cylinder to provide a steam power stroke for the piston, and

(h) a valve-controlled steam exhaust passageway communicating with the cylinder independently of the steam generating chamber for exhausting the cylinder of steam after the steam power stroke.

4,433,549
AIR FUEL ENGINE

Anthony T. Zappia, 12374 Brouptca Rd., Carmel, Ind. 46030

Division of Ser. No. 151,137, May 19, 1980, Pat. No. 4,380,904.
This application Aug. 11, 1982, Ser. No. 407,269
Int. Cl.³ F01B 29/04
U.S. Cl. 60—712 10 Claims

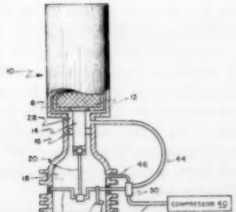


1. An engine comprising in combination:
a plurality of gas-fired cylinders;
a plurality of compressed-fluid activitated cylinders;
a carburetor means;
means for regulating gas supplied to said gasoline-fired cylinders;
means for regulating compressed fluid supplied to said compressed fluid activated cylinders; and
valving means for supplying compressed fluid to said compressed fluid activated cylinders, said valve being activated only after a predetermined quantity of gas is being supplied to said gasoline fired cylinders.

4,433,550
FREE PISTON DISPLACER CONTROL MEANS

Peter Durenec, Annandale, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 28, 1982, Ser. No. 372,787
Int. Cl.³ F25B 9/00
U.S. Cl. 62—6 5 Claims

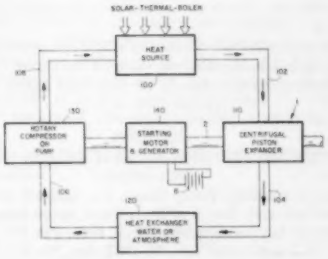


1. A free piston displaces control means comprising:
a split cycle cooler enclosed in a housing having a regenerator-displacer in a cold end working fluid volume with a pneumatic piston attached to the displacer and extending through a passageway into an ambient end pneumatic volume of said housing wherein a friction seal between said pneumatic piston and said passageway forms an effective frictional seal between said working fluid volume and said pneumatic volume in which alternating pressure waves of working fluid are applied to said split cycle cooler through feed line means from a remote compressor to cause piston displacer reciprocal movement within said housing; and
free piston displacer drive means comprised of a rotary crankshaft connected to said penumatic piston and with at least one energy restoring means thereon comprised of a flywheel having a mass of material thereon used as a braking means to counteract the motion of the reciprocating pneumatic piston at the top dead center and the bottom dead center of the strokes to selectively reciprocate said free piston displacer and wherein said rotary crankshaft drives a directional flow control valve for regulating the pressure waves of said working fluid in said feed line means wherein the combined regulated alternating pressure waves and said energy restoring means provide flat top dead center and flat bottom dead center displacer waveforms for better cooler efficiency.

4,433,551
METHOD AND APPARATUS FOR DERIVING MECHANICAL ENERGY FROM A HEAT SOURCE

Edwin W. Dibrell, San Antonio, Tex., assignor to Centrifugal Piston Expander, Inc., San Antonio, Tex.

Continuation-in-part of Ser. No. 436,412, Oct. 25, 1982, Ser. No. 436,852, Oct. 25, 1982, and Ser. No. 451,606, Dec. 20, 1982. This application Jan. 24, 1983, Ser. No. 460,605
Int. Cl.³ F25B 9/00
U.S. Cl. 62—87 9 Claims

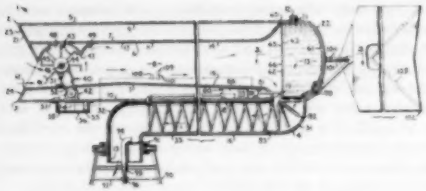


1. The method of extracting mechanical energy from a heat source comprising the steps of:
1. Circulating a charge of a phase convertible, pressured gas in a closed cycle from the heat source to a centrifugal piston expander having a power output shaft, to a series connected heat exchanger and compressor, and then back to the heat source; said rotary expander having a plurality of cylinders co-rotatably mounted on the power output shaft and respectively containing pistons movable solely by gas pressure from a position remote from the axis of rotation of the cylinders to a position proximate to said axis and movable from said proximate position to said remote position solely by centrifugal force;
2. Rotating the power output shaft by a starting motor;
3. Introducing a charge of heated gas in the radially outer ends of said cylinders when said pistons are positioned by centrifugal force in said axially remote positions, thereby driving said pistons inwardly to expand the gas and exerting a reaction torque on the cylinders to drive the power output shaft;
4. Discharging the expanded gas into said series connected heat exchanger and compressor to cool and pressurize same prior to introduction into said heat source; and
5. Driving said compressor by said power output shaft of said rotary expander.

4,433,552
APPARATUS AND METHOD FOR RECOVERING ATMOSPHERIC MOISTURE

Raymond H. Smith, Rte. 2-5AAA, Larned, Kans. 67550

Filed May 20, 1982, Ser. No. 380,419
Int. Cl.³ F25D *17/06*
U.S. Cl. 62—93 **23 Claims**



1. An apparatus for recovering atmospheric moisture, which comprises:
(a) a housing having an atmospheric duct for receiving wind and passing an airstream therethrough;
(b) a turbine mounted on said housing in said atmospheric duct;
(c) an electrical generator driven by said turbine;
(d) refrigeration means operably connected to said electrical generator and including an evaporator positioned in said atmospheric duct for condensing moisture in said airstream;
(e) collection means for collecting said condensed moisture; and
(f) a coolant canister positioned in said atmospheric duct and including an endothermic material therein for cooling and causing said airstream to become more dense.

4,433,553
PROCESS FOR THE REFRIGERATION OF AN ENCLOSURE

Clayton D. Callihan, Baton Rouge, La., assignor to Louisiana State University Board of Supervisors, Baton Rouge, La.

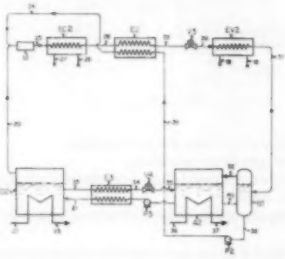
Division of Ser. No. 232,535, Feb. 9, 1981, Pat. No. 4,380,458. This application Sep. 29, 1982, Ser. No. 427,705
Int. Cl.³ F25D *17/06*
U.S. Cl. 62—94 **7 Claims**

1. A process for the refrigeration of an enclosure which comprises contacting a stream of air with a desiccant characterized as solid methyl cellulose wherein from about 0.6 to about 1.8 of the available hydroxyl groups of the anhydroglucose units constituting the basic cellulose entity have been replaced by methyl, or methyl and other hydroxy alkyl or carboxy alkyl groups containing from 2 to about 4 carbon atoms where at least one-half of the substituting groups are methyl, to dehumidify and warm said stream of air,
cooling said stream of air by heat exchange with a cooler non-reactive material,
humidifying said cooled stream of air to refrigerate same, and then
injecting said refrigerated air into said enclosure.

4,433,554
PROCESS FOR PRODUCING COLD AND/OR HEAT BY USE OF AN ABSORPTION CYCLE WITH CARBON DIOXIDE AS WORKING FLUID

Alexandre Rojey, Garches, and Jacques Cheron, Laffite, both of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Jul. 16, 1982, Ser. No. 399,158
Int. Cl.³ F25B *15/00*
U.S. Cl. 62—112 **9 Claims**



1. A process for producing cold and/or heat, making use of an absorption cycle, characterized by the steps of:
(a) subjecting a solution (L1) of carbon dioxide in a liquid phase comprising a solvent for carbon dioxide to heating, under at least partial carbon dioxide desorption conditions, so as to form a gaseous phase (G1) of carbon dioxide and a desorbed liquid phase (S1), and separating the phase (G1) from the phase (S1),
(b) admixing the gaseous phase (G1) with a liquid phase (S2) comprising a solvent for carbon dioxide and removing the heat evolved, so as to dissolve at least a portion of the gaseous phase (G1) into the solvent liquid phase (S2) and to obtain a solution (L2) of carbon dioxide in the solvent liquid phase (S2),
(c) decreasing the pressure of solution (L2) and subjecting said solution to heating, under conditions of at least partial desorption of carbon dioxide, so as to form a gaseous phase (G2) of carbon dioxide and a desorbed liquid phase (S3), and separating the phase (G2) from the phase (S3),
(d) decreasing the pressure of the desorbed liquid phase (S1) substantially to the pressure level of phase (G2) and admixing the phase (S1) with the phase (G2) while removing the evolved heat, so as to obtain a solution (L3) of the phase (G2) in the phase (S1),
(e) increasing the pressure level of solution (L3) substantially to the pressure level of solution (L1) and then feeding back at least a portion of solution (L3), after recompression, to step (a) so as to reconstitute at least a portion of solution (L1), and
(f) increasing the pressure level of the desorbed liquid phase (S3) substantially to the pressure level of the gaseous phase (G1) and then feeding back at least a portion of the liquid phase (S3), after recompression, to step (b) so as to reconstitute at least a portion of the liquid phase (S2).

4,433,555
DEFROSTER FOR A REFRIGERATOR

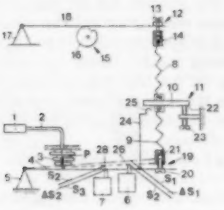
Niels P. Thorsen, Sonderborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

Continuation of Ser. No. 270,094, Jun. 3, 1981, abandoned. This application Dec. 6, 1982, Ser. No. 447,180

Claims priority, application Fed. Rep. of Germany, Jun. 18, 1980, 30227135

Int. Cl.³ F25D *21/06*

U.S. Cl. 62—154 2 Claims



1. Refrigeration apparatus comprising, a compressor motor, an evaporator temperature monitoring sensor, defrosting heating means, actuator means responsive to the temperature of said sensor having first and second displacement ranges with first and second limiting positions corresponding to predetermined lower and upper temperatures, first and second switch means sequentially operated by said actuator means at said lower and upper temperatures, said first switch means being in series with said motor and being cyclically operable within said first displacement range, said second switch means operated by said actuator means at said upper limiting position, counter means having a counting input connected to said first switch means and a reset input connected to said second switch means, interrupter switch means in series with said first switch means and said motor, said counter means being operable to open said interrupter switch means to stop said motor and activate said defrosting heating means after the occurrence of a predetermined count on said counting input, and said counter means being resettable upon said reset input thereof being activated by said second switch means to close said interrupter switch means to start said motor and deactivate said defrosting heating means.

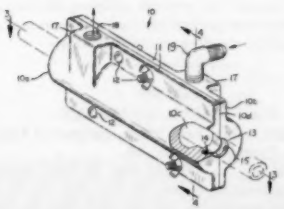
4,433,556
PIPE FREEZING DEVICE

Welby D. Brady, Portland, Oreg., assignor to Temp-Control Corporation, Portland, Oreg.

Filed Oct. 19, 1981, Ser. No. 312,523

Int. Cl.³ F25D *3/00*; F16L *55/10*

U.S. Cl. 62—293 1 Claim



1. A device for freezing water in a length of pipe comprising a tubular housing having a pair of sections forming a tubular inner compartment of a cross dimension larger than the outer diameter of a pipe and at least 10 centimeters in length to form a path for a freezing material,

said housing sections being of symmetrical construction,

said housing sections having opposite flanges arranged to be abutted together,

bolt fastening means in said flanges for releasably securing said housing sections together for installing and removing them laterally on a pipe,

end walls on said housing sections having an opening arranged to fit around a pipe on which said housing is mounted,

seal means in said openings to provide a sealing engagement with a pipe,

an inlet for a freezing material extending into one side of said housing adjacent one end of the latter,

and an outlet for gas from the freezing material extending from said housing on the same side of said housing adjacent the other end of the latter providing free circulation of freezing material around the pipe for at least said 10 centimeters to efficiently form an ice plug in the pipe,

said inlet being in one section and said outlet being in the other section,

said inlet and outlet extending through a portion of said flanges,

said bolt fastening means having selected spacing through said flanges providing only one possible clamped position of said symmetrical housing sections so that said inlet and outlet will always be disposed at opposite ends and on the same side.

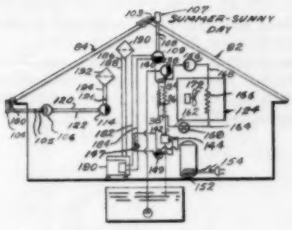
4,433,557
MULTIPLE FLUID MEDIUM SYSTEM

Roy E. McAlister, 5285 Red Rock North, Phoenix, Ariz. 85018

Division of Ser. No. 32,639, Apr. 23, 1979, Pat. No. 4,301,862, which is a continuation-in-part of Ser. No. 6,240, Jan. 24, 1979, Pat. No. 4,316,436, which is a continuation of Ser. No. 774,501, Mar. 4, 1977, abandoned. This application Dec. 4, 1980, Ser. No. 212,751

Int. Cl.³ F25B *13/00*

U.S. Cl. 62—324.1 5 Claims



1. A multiple fluid medium solar energy system for a building comprising

solar panel means for mounting exteriorly of the building having passage means for directing a flow of air therethrough and means for enabling (1) environmentally available solar energy to heat the flowing air and (2) the flowing air to give up heat to the environment when solar energy is not available and temperature conditions are favorable therefor,

interior room air temperature conditioning means for mounting interiorly of said building including return air inlet means for receiving room air to be temperature conditioned, room air outlet means for discharging a supply of temperature conditioned air and blower means for effecting a flow of room air from said return air inlet means to said room air outlet means,

first heat exchanger means including first flow path means for the air flowing from said return air inlet means to said

room air outlet means, second flow path means in heat exchange relation to said first flow path means and third and fourth flow path means in heat exchange relation with one another,

second heat exchanger means having fifth flow path means selectively connected in series with said first flow path means and disconnected therefrom and sixth and seventh flow path means in heat exchange relation to said fifth flow path means,

means defining a temperature storage water circuit including insulated water storage tank means, pump means for pumping water from said storage tank means and water return means for directing water into said storage tank means, and means for directing water from said pump means to said water return means alternatively (1) through said second flow path means or (2) said sixth flow path means,

heat pump means defining a closed refrigerant flow circuit through said third flow path means and said seventh flow path means and including means for alternatively (1) compressing the refrigerant from said third flow path means into said seventh flow path means and expanding the refrigerant from said seventh flow path means into said third flow path means or (2) compressing the refrigerant from said seventh flow path means into said third flow path means and expanding the refrigerant from said third flow path means into said seventh flow path means, and

means defining (1) an environmental air circuit through said solar panel passage means including environmental air inlet means, environmental air outlet means and blower means for causing a flow of air from said environmental air inlet means through said solar panel passage means into said environmental air outlet means and alternatively (2) a closed air circuit through said solar panel passage means, said fourth flow path means and said blower means,

said environmental air circuit defining means including hot air clothes dryer means between said solar panel passage means and said environmental air outlet means.

4,433,558

PARALLEL CONTACT DISTILLATIVE FREEZING PROCESS FOR SEPARATING VOLATILE MIXTURES AND APPARATUSES FOR USE THEREIN

Chen-Yen Cheng, and Sing-Wang Cheng, both of 9605 La Playa St., NE, Albuquerque, N. Mex. 87111

Continuation-in-part of Ser. No. 296,130, Aug. 25, 1981, Pat. No. 4,378,984, Ser. No. 181,002, Aug. 22, 1980, abandoned, and Ser. No. 930,312, Aug. 2, 1978, Pat. No. 4,218,893. This application Oct. 1, 1981, Ser. No. 307,507

Int. Cl.³ B01D *9/04*

U.S. Cl. 62—537 **20 Claims**

1. A crystallization separation process for separating a multi-component mixture that is at least partly in a liquid state and has two key volatile components, denoted respectively as A-component, that volatile non-crystallizing component present in the greatest amount, and B-component, the volatile crystallizing component, into a B-enriched portion and a B-lean portion through formation of a B-enriched solid mass,

Wherein the two key components form a binary system whose constant pressure phase diagram taken at a three phase (B-enriched solid, liquid and vapor) pressure has a two phase (B-enriched solid and vapor) region covering a substantial concentration range above the three phase (B-enriched solid, liquid and vapor) temperature and a two phase (B-enriched solid and liquid) region below the three phase (B-enriched solid, liquid and vapor) temperature, that comprises a first step of forming a first vapor mixture and a first condensed mass that comprises a mother liquor and a solid phase mass enriched in a B-component by concurrently vaporizing the volatile components from the mixture in a first zone under a first temperature and a first pressure that are respectively lower than the triple point temperature and the triple point pressure of the pure B-component, wherein the improvement comprises providing parallel contact operation by:

(1) conducting the first step in a processing zone that has a first position and second position, introducing feed at the first position and discharging the first condensed mass at the second position;

(2) transferring both the first vapor and the first condensed mass in the direction from the first position toward the second position, allowing the first vapor to interact with the first condensed mass while they are both transferred in the same direction; the pressure gradient from the first position to the second position being maintained by the flow of the first vapor.

13. A distillative freezing system for separating a multi-component mixture that is at least partly in a liquid state and has two key volatile components, denoted respectively as A-component, that volatile non-crystallizing component present in the greatest amount, and B-component, the volatile crystallizing component, into a B-enriched portion and a B-lean portion through formation of a B-enriched solid mass, wherein the two key components form a binary system whose constant pressure phase diagram taken at a three phase (B-enriched solid, liquid and vapor) pressure has a two phase (B-enriched solid and vapor) region covering a substantial concentration range above the three phase (B-enriched solid, liquid and vapor) temperature and a two phase (B-enriched solid and liquid) region below the three phase (B-enriched solid, liquid and vapor) temperature, that comprises means for providing parallel contact operation including, a distillative freezing zone, a condensing zone, a product melting zone, and a pressure isolating feeder connecting the product melting zone to the distillative freezing zone, wherein the distillative freezing zone has a first position and a second position and includes at least one conveying means conveying from the first position to the second position and a means for introducing feed at the first position, so that, as the feed is concurrently vaporized and solidified to form a first vapor and a first condensed mass that includes a mother liquor and a solid phase mass, both the first vapor and the first condensed mass are transferred in the direction from the first position towad the second position, allowing the first vapor to interact with the first condensed mass continually as they are both transferred in the same direction; the first condensed mass being discharged from the distillative freezing zone at the second position and introduced to the product melting zone though the pressure isolating feeder, and the pressure gradient from the first position to the second position being maintained by the flow of the first vapor.

4,433,559

ICE MAKING APPARATUS

Joseph R. Spinner, Albert Lea, Minn., assignor to King-Seeley Thermos Co., Prospect Heights, Ill.

Continuation of Ser. No. 187,133, Sep. 15, 1980, abandoned, which is a continuation of Ser. No. 867,892, Jan. 9, 1978, abandoned. This application Jul. 28, 1982, Ser. No. 402,586

Int. Cl.³ F25C *5/14*

U.S. Cl. 62—354 **17 Claims**

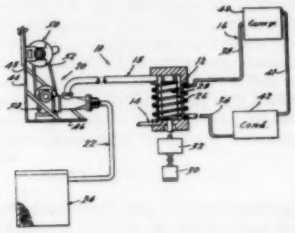
1. In combination in apparatus for producing discrete ice cubes,

a flake ice making mechanism having an outlet portion through which flake ice is supplied, said mechanism including a freezer chamber and a rotatable ice auger,

an extruder device having an extruder body defining a circular extruder chamber having a wall having a frusto conical section and an inlet which opens into said wall,

ice conduit means for communicating flaked ice from said flake ice outlet to said inlet of said extruder body,

an ice extruding auger rotatably disposed interiorly of said chamber having a root and a frusto conical helical ice advancing flight thereon of substantially the same diameter and length as the corresponding chamber section,



the root of said auger and said wall section providing an annular space of progressively decreasing radial extent in which flake ice passing thereinto is dewatered and compressed into a relatively solid ice mass and is forced outwardly through said outlet,

said inlet being arranged at generally right angles to the longitudinal axis of said chamber and having the center line thereof offset laterally from the rotational axis of said auger, and said outlet extending parallel to said rotational axis and positioned at the smaller end of said wall section.

4,433,560

PRESSER FOOT FOR A KNITTING MACHINE

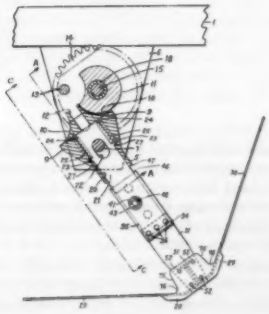
Max W. Betts, Coventry, England, assignor to Courtaulds Limited, London, England

Continuation of Ser. No. 167,206, Jul. 9, 1980. This application Aug. 6, 1982, Ser. No. 406,120

Claims priority, application United Kingdom, Jul. 13, 1979, 7924463

Int. Cl.³ D04B 7/04

U.S. Cl. 66—64 **8 Claims**



1. In a presser foot device for a flat V-bed knitting machine with independently operable needles, the device comprising a presser foot carriage adapted for movement along the needle beds of the machine in synchronism with needle operation, and a support element extending, when the device is fitted to the machine, down towards the gap between the walls of the needle beds and resiliently mounted in relation to said carriage for up-and-down movement, the improvement comprising (a) presser means fixedly mounted on said support element, said means having, in operation, leading and trailing ends and being capable of operating over a region extending from in front of the commencement of the rise of the needles for knitting to the area of needle cross-over, (b) a continuous stitch guide surface provided on said means in the neighbourhood of each bed wall and arranged, in the operative position of said presser means, to extend downwardly and rearwardly, and then generally rearwardly, to push down and hold down stitches near said wall, and (c) a resilient presser foot also fixedly mounted on said support element to extend rearwardly from said presser means beneath the needle tent at a height, in the region of the trailing end of said presser means, above said stitch guide surfaces thereof.

4,433,561

GAUGE CHANGING APPARATUS

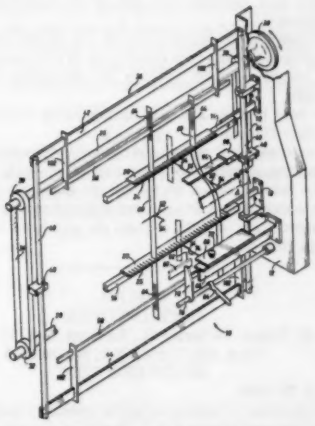
Reinhards Vitols, Tollerton; Steven Walkinshaw, Loughborough; John E. Baker, Birstall; Hywel R. Davies, Buntingford, and Adrian M. Woodward, Bulwell, all of England, assignors to Corah Limited, Leicester, England

Filed Jul. 31, 1981, Ser. No. 288,942

Claims priority, application United Kingdom, Aug. 2, 1980, 8025309

Int. Cl.³ D04B 9/40

U.S. Cl. 66—148 **16 Claims**

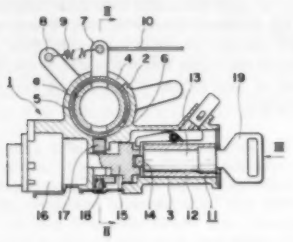


1. An apparatus for transferring knitted fabric from needles spaced in accordance with a first pattern to neddles spaced in accordance with a second pattern, comprising a base; carrier means mounted on said base and movable in a first path on said base; a plurality of substantially parallel elongate points attached to said carrier means so as to be movable both laterally of said path and with said frame means between a first position wherein said points are spaced in accordance with said first pattern and a second position wherein said points are spaced in accordance with said second pattern; and guide means on said carrier means and said base for guiding movement of said points towards and away from one another laterally of said path to alter the spacing of said points as said points are moved along said path by said frame means from one of said first and second positions to the other.

4,433,562
STEERING SHAFT LOCKING DEVICE

Takaoki Tsuchiya, Nagoya, Japan, assignor to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi, Japan

Filed Mar. 10, 1982, Ser. No. 356,645
Claims priority, application Japan, Mar. 12, 1981, 56-34499[U]
Int. Cl.³ B60R 25/02
U.S. Cl. 70—186 **4 Claims**



1. A steering shaft locking device including a sleeve in which a steering shaft is rotatably accommodated, and a housing so that a lock member may be projectable for its engagement with said steering shaft in response to rotation of a rotary member of a cylinder lock with an axis of said sleeve intersecting with that of said housing, said steering shaft locking device comprising:

a rotary ring formed with a boss portion, which is rotatably provided in said sleeve so as to enclose an outer circumference of said steering shaft at a position of projection of said lock member into and of its retraction from said sleeve;

said boss portion being projected out of said sleeve;

a spring for urging said rotary ring in the direction towards a regular angular position for unlocking said steering shaft;

said boss portion and said spring being mounted on said rotary ring; and

a wire connected, at one end thereof, with said boss portion and connected, at the other end, either with a seat whose top face is caused to selectively move downwards and upwards when a driver takes said seat and leaves said seat, respectively or with a door, etc. arranged to be opened and closed.

4,433,563
LOCK DECODER

Glenn E. Wilson, 24 Spring St., Endicott, N.Y. 13760

Filed Apr. 7, 1982, Ser. No. 366,355
Int. Cl.³ E05B 17/00
U.S. Cl. 70—446 **13 Claims**

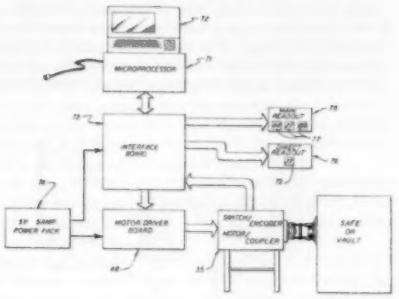
1. Apparatus for determining the opening combination of a lock of the type having a dial containing a number of equally spaced integers thereabout, a plurality of tumblers that are placed in alignment when an opening combination is set into the lock, a driver operatively connected to the tumblers that is able to move through a lock opening sequence when the tumblers are aligned to withdraw the lock bolt, the apparatus including

a rotor means for engaging both the dial and the driver of the lock for turning the dial in either direction so that a combination can be set into the lock and for moving the driver through an opening sequence,

programmable means for controlling the rotor means for moving the dial through an ordered sequence of combinations and to move the driver through the opening sequence after each combination is set into the lock,

sensing means connected to the rotor means for detecting the instantaneous position of the dial and sending a coded signal to the programmable means indicative of the dial position,

readout means connected to the programmable means for sequentially recording each combination that is set into the lock, and

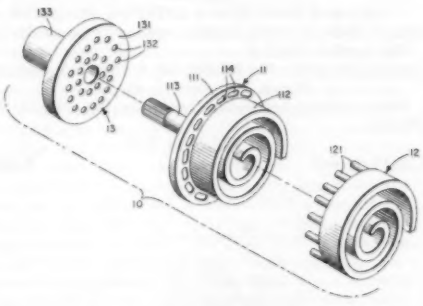


inhibiting means for holding the combination recorded in the readout means when the lock bolt is withdrawn by said driver.

4,433,564
SCROLL MANUFACTURING TOOL

Eiji Fukushima, Fujimi; Seiichi Fukuhara, Gunma, and Masaharu Hiraga, Honjo, all of Japan, assignors to Sanden Corporation, Gunma, Japan

Filed May 20, 1982, Ser. No. 380,141
Claims priority, application Japan, May 20, 1981, 56-76138
Int. Cl.³ B21C 47/00
U.S. Cl. 72—146 **4 Claims**



1. A manufacturing tool for finishing a preformed scroll for use in a scroll type fluid displacement apparatus comprising:

(a) a working member having an end plate, a first involute element extending from one end surface of said end plate, and a plurality of arc shaped holes along an outer side wall of said first involute element;

(b) a second involute element rotatably coupled to said working member and interfitting with said first involute element in a disposition to define a radial gap between the first and second involute elements, and a plurality of pins projecting axially from an axial end of said second involute element and penetrating through said arc shaped holes, said pins being rotatably movable within said arc shaped holes; and

(c) a rotatable member having a plurality of holes extending in the axial direction, said pins having axial end portions extending into said holes in said rotatable member to

couple said rotatable member to said second involute member and to transmit the rotation of said rotatable member to said second involute element to effect relative rotation between said first and second involute elements to adjust said radial gap between an inner side wall of said first involute element and an outer side wall of said second involute element and thereby position said last-mentioned side walls into contact with said preformed scroll positioned in said radial gap to deform said scroll to finished dimensions.

4,433,565

METHOD OF AND APPARATUS FOR THE MANUFACTURING OF METAL PROFILE MEMBERS, ESPECIALLY STEEL PROFILE MEMBERS

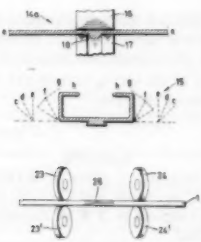
Hans Preller, Cologne, Fed. Rep. of Germany, assignor to Theodor Wuppermann GmbH, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 24,834, Mar. 28, 1979, abandoned. This application May 11, 1981, Ser. No. 262,660

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1978, 2813636

Int. Cl.³ B21D *47/01, 37/16*

U.S. Cl. 72—177 **24 Claims**



1. A method for manufacturing steel profile members of open or closed construction from a continuous steel band of uniform wall thickness, wherein at least one predetermined portion of each of said profile members has a cross-sectional thickness greater than said wall thickness of said band, said method comprising:

(a) providing a source of a continuous steel band of uniform wall thickness over its entire cross-sectional width;

(b) continuously feeding without interruption said steel band along a predetermined path;

(c) continuously heating at least one predetermined portion of the cross-sectional width of said steel band, said at least one heated predetermined portion being intermediate opposite longitudinal edges of said steel band with other portions extending from opposite sides of said heated predetermined portion towards the edges of said steel band;

(d) hot-shaping and deforming at least a cross-sectional part of said heated at least one portion of the cross-sectional width of said steel band at at least one location along said path by engaging only a segment of at least one of said other portions of said band at opposite sides of said heated predetermined portion with a conveying means and conveying said at least one other portion of said band transverse to the feed direction of said band along said path a predetermined distance towards said heated portion to continuously direct flow of steel in said heated portion transverse to the feed direction of said band along said path and increase the volume of steel and reshape and increase the wall thickness of said heated portion while the wall thickness of the remainder of said cross-sectional width of said steel band remains unchanged and at its original wall thickness; and

(e) continuously bending by cold-shaping at least one of said other portions of said cross-sectional width of said steel band at at least one other location along said path while the thickness of said at least one other portion remains unchanged and at its original thickness.

4,433,566

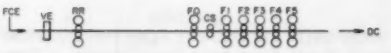
CLOSE COUPLED REVERSING ROUGHER AND FINISHING TRAIN AND METHOD OF ROLLING

George W. Tippins, and Vladimir B. Ginzburg, both of Pittsburgh, Pa., assignors to Tippins Machinery Company, Inc., Pittsburgh, Pa.

Filed Sep. 29, 1981, Ser. No. 306,892

Int. Cl.³ B21B *1/32, 1/02*

U.S. Cl. 72—229 **3 Claims**



1. A method of rolling slabs to strip thicknesses on the order of 500–1000 PIW on a hot strip mill including at least one roughing reversing mill for forming a transfer bar, an F0 mill stand and a finishing train having a plurality of mill stands for reducing the transfer bar to strip comprising:

A. spacing said reversing mill from the F0 mill stand by a distance greater than the length of the transfer bar on the downstream pass immediately prior to the penultimate pass through said at least one rougher but less than the distance of the final pass through said at least one rougher;

B. reducing said slab to a free transfer bar on a reversing rougher in a first pass directed downstream;

C. further reducing said free transfer bar through said reversing rougher in a second pass directed upstream; and

D. passing said transfer bar directly and uninterruptedly from said reversing rougher through said reversing mill in a third reducing pass reducing said transfer bar to a thickness of on the order of 3 inches and in a downstream direction while speed matching it in close coupled relationship to said F0 stand and said finishing train, without coiling said bar.

4,433,567

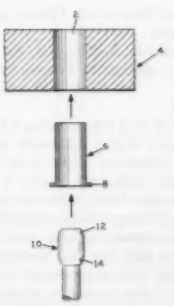
METHOD FOR WORKING HOLES

Albert R. Mead, Setauket, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Nov. 12, 1981, Ser. No. 320,842

Int. Cl.³ B21D *41/02*

U.S. Cl. 72—342 **9 Claims**



1. A method for forming and working a hole through a workpiece comprising the steps of:

forming a hole of fixed diameter through the workpiece;

inserting through such hole a circular reusable sleeve of memory metal having a preset memory O.D. slightly less than the diameter of such hole to be worked and having a uniform wall thickness;

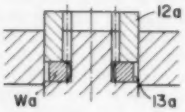
inserting into the I.D. of said circular reusable sleeve a mandrel having an O.D. slightly larger than the I.D. of said reusable sleeve, the combined O.D. of said mandrel and wall thickness of said reusable sleeve is expanded equaling the diameter to which said hole is to be worked;
forcing said mandrel through said reusable sleeve to expand said reusable sleeve and work said workpiece around said hole;
removing said mandrel from said reusable sleeve;
leaving said expanded reusable sleeve in said hole until said reusable sleeve contracts to said preset memory O.D.; and
removing said contracted reusable sleeve from said worked hole.

4,433,568

PRECISION CLOSED-DIE FORGING METHOD

Kazuyoshi Kondo, Hamamatsu, Japan, assignor to Kabushiki Kaisha Wako, Iwata, Japan

Filed May 12, 1981, Ser. No. 262,957
Claims priority, application Japan, May 21, 1980, 55-66401
Int. Cl.³ B21D *22/00*
U.S. Cl. 72—356 **15 Claims**



1. A closed-die forging method which comprises:
(a) placing a workpiece within a set of closed dies;
(b) forcing one of the dies against the opposed die to cause lateral flowing or spreading of the workpiece in a first direction, the workpiece being now restrained from spreading in other directions;
(c) setting the workpiece free of the restraint from spreading in a second direction, different from the first direction, approximately when the spreading of the workpiece in the first direction slows down; and
(d) again forcing one of the dies against the opposed die to cause spreading of the workpiece in both first and second directions, until the workpiece completes spreading in the first direction.

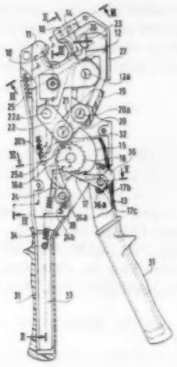
4,433,569

CRIMPING TONGS

Joseph Santinelli, Valmondois, France, assignor to Mars Alcatel, Paris, France

Filed Feb. 5, 1982, Ser. No. 346,230
Claims priority, application France, Feb. 11, 1981, 81 02650
Int. Cl.³ B21D *9/08*
U.S. Cl. 72—410 **6 Claims**

1. A compression tool for crimping a sleeve onto a cable, the tool having a body with a stationary handle fixed thereto, a movable handle connected to the body for movement toward and away from the stationary handle, a pair of jaws mounted on the body, one jaw being movable toward and away from the other, a pair of hinged links situated at an angle and forming a toggle joint connecting said jaws, the toggle joint being operable to move said one jaw toward the other when the angle between the links is increased, a cam provided with a ratchet, the cam being rotatably mounted on said body for operating said toggle joint, a spring-biased advance catch connected to the movable handle and contacting the ratchet for rotating said cam when the movable handle is moved toward the stationary handle, and a spring-biased retainer catch connected to the body and contacting the ratchet for holding the cam when the movable handle is moved away from the stationary handle, wherein the improvement comprises:
a spring attached to the body and toggle joint and acting on the toggle joint to increase the angle between the links for urging the one jaw toward the other jaw and
a trigger connected to the toggle joint such that pressure on the trigger will decrease the angle between the links



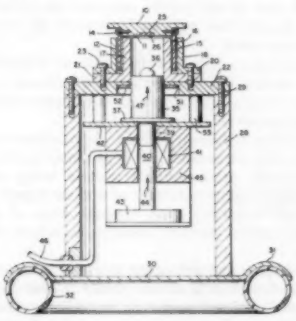
against the force of the spring to move the one jaw away from the other to permit insertion of a sleeve for crimping between the jaws, subsequent release of the trigger allowing the force of the spring to hold the sleeve in crimping position between the jaws.

4,433,570

MECHANICAL SHOCK MACHINE

Jack M. Brown, Costa Mesa, and Terrance S. Miller, El Toro, both of Calif., assignors to B & W Engineering Corporation, Costa Mesa, Calif.

Filed Dec. 24, 1981, Ser. No. 334,283
Int. Cl.³ G01N *3/30*
U.S. Cl. 73—12 **4 Claims**



1. A mechanical shock generating machine comprising:
(a) a platen for mounting thereon a component to be shock tested;
(b) a skirt secured to said platen and depending therefrom;
(c) a viscous fluid surrounding said skirt for permitting said platen to move in a vertical direction under the influence of a mechanical impact and for dampening ringing of said platen under the influence of said impact;
(d) a shock pad mounted on the lower surface of said platen for receiving said impact, said shock pad consisting of a yieldable material;
(e) a metal bullet having a rounded nose;
(f) means for accelerating said bullet upwards toward said shock pad and in free flight for causing said bullet nose to

impact said shock pad, thereby to lift said platen against the viscous action of the fluid; and

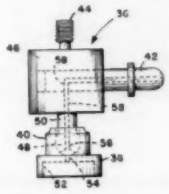
(g) means for stopping the flight of said bullet after it has delivered the mechanical impact to said shock pad.

4,433,571

NON-CONTACTING GAGE TIP PAD

Ralph K. Snow, Jr., Medford Lakes, N.J., assignor to Schaevitz Engineering, Pennsauken, N.J.

Filed Dec. 8, 1980, Ser. No. 213,943
Int. Cl.³ G01B 13/06
U.S. Cl. 73—37.5 **5 Claims**



1. A non-contacting gage tip for a gage head comprising:

a cylindrical air-bearing sensing pad having sharp edges with a recess formed with sharp edges therein and including a porous material,

said porous material filling said recess,

swivel mounting means for attaching said air-bearing sensing pad to a gage head, and

air fitting means mounted on said swivel mounting means for receiving a source of air

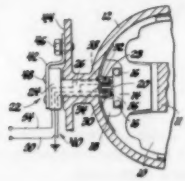
wherein the sharp edges contribute to the operation of the air-bearing sensing pad in accepting small, imperfect, perturbations in the surface under measurement without spilling or loss of air and an associated change in the air gap.

4,433,572

ENGINE OPERATION RELATED EVENT TIMING SYSTEM

Arthur R. Sundeen, Lansing, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 9, 1982, Ser. No. 396,814
Int. Cl.³ G01M 15/00
U.S. Cl. 73—116 **3 Claims**



1. In an internal combustion engine including a piston which cyclically reciprocates between top and bottom dead center positions in synchronism with the speed of the engine, apparatus comprising:

means for sensing passage of the piston through a reference position at time T_1 as the piston moves toward one of the dead center positions and at time T_4 as the piston moves away from the dead center position thereby defining a time interval C between times T_1 and T_4,

means for sensing the engine velocity W_o substantially at time T_1 and W_f substantially at time T_4; and

means for determining the duration of an interval DC between time T_1 and the time T_{dc} at which the piston passes through the dead center position by simultaneously solving the motion expressions:

$$\phi_{dc} = (\tfrac{1}{2})A_r(DC)^2 + W_o(DC)$$

and

$$2\phi_{dc} = (\tfrac{1}{2})A_r(C)^2 + W_o(C)$$

where A_r is the average engine acceleration between times T_1 and T_4 and ϕ_{dc} is the distance between the dead center position and the reference piston position, thereby yielding

$$DC = -\frac{W_o}{A_r} + \left[\left(\frac{W_o}{A_r}\right)^2 + \left(\frac{W_o}{A_r}\right)(C) + \frac{(C)^2}{2}\right]^{\frac{1}{2}}$$

where the quantity

$$\left(\frac{W_o}{A_r}\right)$$

is determinable solely as a function of times T_1 and T_4, and engine velocities W_o and W_f, substantially according to the expression:

$$\frac{W_o}{A_r} = \frac{W_o(C)}{(W_f - W_o)}$$

whereby the distance ϕ_{dc} may be unknown, and the determination of time interval DC is substantially insensitive to variations in the distance ϕ_{dc} due to part tolerances during engine assembly or during subsequent engine operation.

4,433,573

METHOD AND APPARATUS FOR DETERMINING THE FLOW CHARACTERISTICS OF A FLUID IN A WELL

Jean-Pierre Hulin, Saint-Maur, France, assignor to Schlumberger Technical Corporation, Houston, Tex.

Filed Jun. 23, 1982, Ser. No. 391,276
Int. Cl.³ E21B 47/00
U.S. Cl. 73—155 **9 Claims**

1. A method for determining the flowrate of a fluid flowing in a well, comprising the steps of:

lowering in the well a logging sonde comprising at least one vortex street generating obstacle and a transducer responsive to pressure variations due to the generation of vortices, the transducer producing, for each depth in the well, a detection signal the useful component of which has a frequency f and an amplitude A,

deriving from the detection signal a first signal indicative of frequency f,

deriving from the detection signal a second signal indicative of the reduced amplitude Ar, defined as the ratio A/f^2, and

forming from the first and second signals an indication of the flowrate in accordance with a first predetermined relationship expressing the frequency f as a function of the flowrate and of the bubble rate of the fluid at the respective depth, the first relationship including a linear dependency of the frequency f upon the flowrate, and a second predetermined relationship expressing the reduced amplitude Ar as a function of the bubble rate and of the flowrate.

4,433,574
FLOWMETER

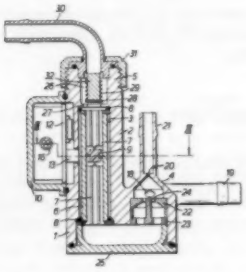
Anthony P. Williams, and Ralph G. Carter, both of Hampshire, England, assignors to Brandhurst Company Limited, Bucks, England

Filed Jun. 30, 1982, Ser. No. 393,607

Claims priority, application United Kingdom, Jul. 6, 1981, 8120846

Int. Cl.³ G01F *15/08*

U.S. Cl. 73—200 **13 Claims**



1. A liquid flow measuring device comprising a transducer having a substantially vertical bore with upper and lower ends, a vaned rotor received in said bore and rotatable by the liquid flowing through the bore, and a light source and a photosensitive element mounted at opposite sides of the bore, a light path between said light source and said photosensitive element being interrupted intermittently by the rotor vanes when the rotor is rotated, means defining a separation chamber for separating gas and vapour from the liquid flow, said chamber having an inlet, an outlet for separated gas and vapour positioned above said inlet, and an outlet for liquid positioned below said gas and vapour outlet, and a passageway connecting said liquid outlet to said lower end of the transducer bore whereby the liquid flows upwardly through the transducer after leaving the separation chamber.

4,433,575
FLOW SPLITTING DEVICE FOR FLUID FLOW METER

Ralph E. Rutherford, 16428 Englewood, Los Gatos, Calif. 95030

Filed May 19, 1981, Ser. No. 265,339

Int. Cl.³ G01F *1/46, 5/00*

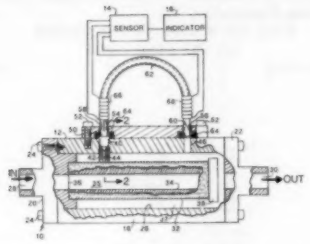
U.S. Cl. 73—202 **10 Claims**

1. In a flow meter of the type having splitter means for splitting off a sample of a fluid flow stream to be monitored, sensing means for sensing the flow of fluid in the split stream, and means for indicating the output of the sensing means, an improved splitter means comprising:

housing means forming an internal cavity having an inlet and an outlet;

porous baffle means disposed within said cavity so as to divide said cavity into a first chamber communicating with said inlet and a second chamber communicating with said outlet;

plug means disposed at least partially within said second chamber and engaging a wall of said baffle means, said plug means having an opening therein forming a passageway for fluid passing through a predetermined area of said porous baffle means defined by said opening;



sensing tube means having one end communicating with said plug means to receive fluids passing through said passageway, and an opposite end communicating with said second chamber, whereby fluids flowing into said inlet pass into said first chamber, through said baffle means into said second chamber, and thence out through said outlet with a predetermined portion of the fluid flowing through said baffle means passing through said tube means prior to passing into said second chamber.

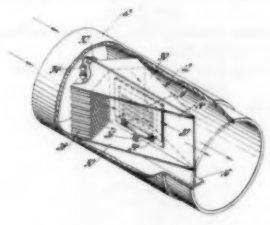
4,433,576
MASS AIRFLOW SENSOR

Kelvin Shih, Brighton; Kurt A. Pochert, Hartland, both of Mich., and James M. Dunford, Cupertino, Calif., assignors to General Motors Corporation, Detroit, Mich.

Filed Sep. 20, 1982, Ser. No. 419,937

Int. Cl.³ G01F *1/68*

U.S. Cl. 73—204 **8 Claims**



1. In a flow meter, a mass airflow sensor having a sensor resistor controlled to a determined temperature by a heating current, the improvement comprising:

a film resistor element including a dielectric film, and a metal film sensor resistor supported on the dielectric film, the dielectric film having mounting regions spaced from the metal film, the metal film having a substantial change of resistivity with temperature,

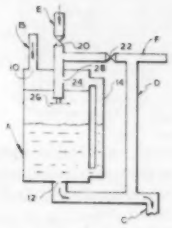
support means for engaging the film resistor element at the said mounting regions with the sensor resistor spaced from the support means for thermal isolation from the support means whereby the resistor element has small thermal mass, and

means for converging the flow of an airstream toward the film resistor element to obtain a consistent airflow at the resistor element and a positive cooling effect by the airstream.

4,433,577
APPARATUS FOR METERING LIQUID FLOW

Boris Khurgin, 14 David Marcus St., Haifa, Israel; Shlomo Rosinek, 149 Levi Eshkol St., Kiron, Israel, and Isaac Rinkewich, 53 David Hamelech Blvd., Tel-Aviv, Israel 64237

Filed Jun. 4, 1981, Ser. No. 270,226
Int. Cl.³ G01F *23/00*; A01J *7/00*
U.S. Cl. 73—290 V 9 Claims

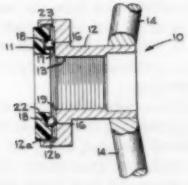


8. For use with a source of liquid, apparatus for measuring the flow of the liquid comprising an inlet tube connected to the source; a enclosed container, said container comprising an inlet port operably connected to said inlet tube such that liquid is supplied to said container; an orifice situated to permit liquid to drain from said container; an outlet tube operably connected to said orifice; means operably connecting said container, at a point above the liquid therein, and said outlet tube, for equalizing the pressure therebetween; and means for sensing the level of liquid in said container and for generating a signal representative of the instantaneous rate of liquid flow through said container in accordance with said sensed level, said sensing means comprising ultrasonic detection means.

4,433,578
WHEEL CLAMPING NUT WITH FREELY ROTATING INSERT

Ronald L. Hill, Conway, Ark., assignor to FMC Corporation, Chicago, Ill.

Continuation of Ser. No. 100,620, Dec. 5, 1979, abandoned. This application Nov. 30, 1981, Ser. No. 326,105
Int. Cl.³ G01M *1/06*
U.S. Cl. 73—487 3 Claims



1. In a dynamic wheel balancer having a driven threaded wheel-mounting shaft carrying thereon a wheel backing plate for engaging and driving a wheel mounted on said shaft at high speed in a balancing operation a wheel holding member carried by said shaft and a clamping nut having threaded engagement with said shaft to clamp the wheel between the wheel backing plate and said wheel holding member the improvement comprising,

said nut having a threaded bore merging at one end into an outwardly radially extending annular face terminating in an axial projection with an inwardly projecting retaining lip,

an annular resilient insert having a bore for said shaft and having a smaller diameter portion extending axially outwardly from said lip terminating in an outer radial face for engagement with said wheel holding member on said shaft, and further having a larger diameter portion inwardly of said lip terminating in an inner radial face in spaced relation to said nut radial face, thereby to loosely retain said insert in association with said nut,

said inner radial face having an annular raceway formed therein and having a nonresilient backing plate in the bottom of said raceway, and,

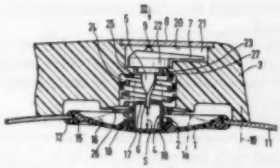
bearing members in said raceway engaging said nonresilient plate and said nut radial face thereby to space said insert from said nut radial face and permit substantially free rotation of said nut in clamping a wheel on said shaft while said insert frictionally engages said wheel holding member to be substantially stationary with respect thereto,

thereby firmly clamping said wheel for balancing while precluding unthreading torque forces on said nut.

4,433,579
PRESSURE INDICATOR

Walter Horn, Idar-Oberstein, Fed. Rep. of Germany, assignor to Fissler Gesellschaft mit beschrankter Haftung, Idar-Oberstein, Fed. Rep. of Germany

Filed Feb. 24, 1982, Ser. No. 352,037
Claims priority, application Fed. Rep. of Germany, Mar. 3, 1981, 3108017
Int. Cl.³ G01L *7/08*
U.S. Cl. 73—715 12 Claims



1. A pressure indicator on a steam pressure cooker or similar container having a container opening, said pressure indicator comprising:

a twist-giver nut provided with a recess;

a twist spindle extending through said nut recess;

said twist spindle having a cross section corresponding to said nut recess;

one of said twist-giver nut and twist spindle defining a driving member, and the other one of said twist-giver nut and twist spindle defining a rotating member, said rotating member being rotated by axial movement of said driving member;

a membrane of elastic material being secured adjacent to the container opening with said membrane being stretched to close the container opening;

a casing disposed on the container above the container opening, said casing being provided with an open space for receiving said rotating member, said open space facing downwardly towards an outer surface of said membrane, and said open space extending upwardly to a removable window zone of said casing;

first means for securing said driving member against rotation on said outer surface of said membrane so that said driving member moves together with said membrane to provide said axial movement;

said rotating member being provided with a pointer and a cam at one end thereof spaced from said driving member;

second means for rotatively mounting said rotating member in said open space of said casing with said pointer disposed adjacent to said window zone; and

said cam being disposed against an inner surface of said window zone to prevent axial movement of said rotating member;

whereby when internal pressure within the container acts

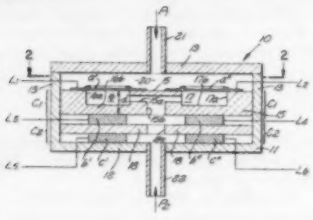
against said membrane, said membrane is raised together with said driving member to rotate said rotating member together with said pointer proportionally to the internal pressure.

4,433,580

PRESSURE TRANSDUCER

Emanuel Tward, Northridge, Calif., assignor to Tward 2001 Limited, Los Angeles, Calif.

Filed Jul. 22, 1982, Ser. No. 400,760
Int. Cl.³ G01L 9/12
U.S. Cl. 73—718 **12 Claims**



1. A capacitive type pressure sensing transducer comprising:
(a) a first transducer body element formed of dielectric material and with two like recesses on a first planar surface thereof;
(b) a second transducer body element formed of dielectric material and positioned in parallel relationship with said first body element adjacent the second planar face of said first element;
(c) a first pair of like electrically conductive flat capacitor plates located between said first and second body elements and aligned with the recesses on the first planar face of said first body element;
(d) a second pair of like electrically conductive flat capacitor plates aligned with said first pair of capacitor plates and spaced therefrom by the second tranducer body element, said first and second pairs of capacitor plates forming two plate type capacitors of like fixed electrical capacitive value; and
(e) a pair of like electrically conductive pressure sensitive elements spanning the recesses on the first planar face of said first body element and sealed at their respective peripheries to said body element to form two like pressure chambers, said pair of pressure sensitive elements and said first pair of capacitor plates with the intervening pressure chambers and dielectric material of said first body element forming two plate type capacitors of like variable electrical capacitive value, the application of an external pressure force to said pressure sensitive elements causing deflection thereof and a change in the spacing distance between said pressure sensitive elements and said capacitor plates thereby varying the electrical capacitive value of said variable value capacitors in direct relationship to the applied pressure force value.

4,433,581

OFFSHORE PLATFORM STRUCTURAL ASSESSMENT SYSTEM

David R. Scott, 44064 N. 28th St., Lancaster, Calif. 93534, and Thomas S. Rhoades, 420 Buckeye Dr., Colorado Springs, Colo. 80919

Division of Ser. No. 265,031, May 18, 1981, which is a continuation-in-part of Ser. No. 86,772, Oct. 22, 1979, Pat. No. 4,287,511. This application Dec. 23, 1981, Ser. No. 333,746
Int. Cl.³ G01M 5/00
U.S. Cl. 73—786 **1 Claim**

1. A system for collecting and interpreting data reflecting the effect of at least a selected one of a plurality of forces on an offshore platform structure, said system comprising, in combination:
(a) at least one structural moment detector carried by said structure for generating output signals in response to said plurality of forces acting on said structure;

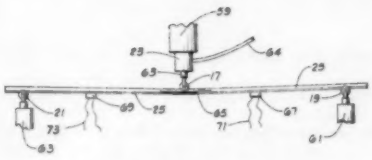
(b) means for processing said output signals to modify the information content thereof, including rejecting components of said signals which reflect the effects of extraneous forces other than said selected one;
(c) means for manipulating said processed signals to provide secondary signals responsive to the condition of said structure as a result of the application of said selected force.

4,433,582

DAMPING DEVICE FOR USE WITH ACOUSTIC INFORMATION GENERATION MACHINES

Michael W. Joosten, Ponca City, Okla., assignor to Conoco Inc., Ponca City, Okla.

Filed May 26, 1981, Ser. No. 267,109
Int. Cl.³ B32B 15/04; G01N 3/20, 29/04
U.S. Cl. 73—788 **2 Claims**



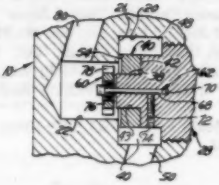
1. An improved testing device for stressing a test member producing acoustic information from the test member relating to changes occurring in the test member due to the stressing of the test member, of the type having at least one stress for contacting the test member and applying a stress thereto, the improvement comprising:
a metal isolation piece comprising a shape-memory alloy (an alloy having the capacity to regain its shape upon heating after deformation) disposed along the stress member so that acoustic emissions transmitted through said stress member must encounter said metal isolation piece, said metal isolation piece having resistance to deformation, wherein said metal isolation piece is disposed for contacting the test member and applying a stress thereto, wherein said metal isolation piece comprises a roller mounted on the end of the stress member, wherein said metal isolation piece consist essentially of an austenitic phase of said shape-memory alloy, and wherein said testing device further includes at least two other stress members disposed for contacting the test member and opposing the stress applied by at least one stress member so that a binding force can be applied to the test member;
each of at least two other stress members having mounted on the end thereof a roller for contacting the test member, said roller consisting essentially of an austenitic phase of a shape-memory alloy.

4,433,583

FLOW METER

William H. Kirk, 3112 Starr Rd., Royal Oak, Mich. 48073

Filed Jun. 21, 1982, Ser. No. 390,698
Int. Cl.³ G01F 1/06
U.S. Cl. 73—861.33 11 Claims



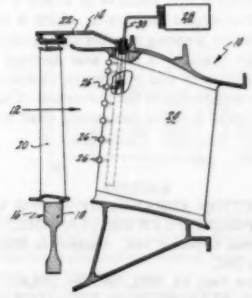
1. A flow meter comprising a body, a first chamber in said body, a fluid inlet in communication with said first chamber, a second chamber in said body, a fluid outlet in communication with said second chamber, a rotor member disposed in said second chamber, at least one orifice for flowing fluid from said first chamber into said second chamber, said orifice being a channel having an inlet in said first chamber and an outlet in said second chamber, said channel being arranged to provide a swirling motion to the fluid flow from said first chamber to said second chamber, said rotor being disposed such as to be acted upon by the fluid in swirling motion for causing said rotor to rotate at a velocity proportional to the fluid flow rate through said orifice, a toothed wheel formed integrally with said rotor, a light source, means for projecting a light beam from said light source upon the periphery of said toothed wheel whereby said light beam is periodically reflected from said toothed wheel, a photosensitive element and means for transmitting said periodically reflected light beam to said photosensitive element, said photosensitive element providing at its output a signal of a frequency proportional to the velocity of rotation of said toothed wheel.

4,433,584

TOTAL PRESSURE PROBE

Joseph M. Kokoszka, Enfield, and Rocco M. Tommasini, West Hartford, both of Conn., assignors to United Technologies Corp., Hartford, Conn.

Filed Nov. 27, 1981, Ser. No. 325,258
Int. Cl.³ G01F 1/46
U.S. Cl. 73—861.66 16 Claims



1. A method of sensing total pressure in a duct bounding a flow path for a working medium fluid utilizing a pressure probe having a flow alignment passageway extending to the interior of the probe and a sensor portion comprising the steps of:

diverting a portion of the flow from the working medium flow path to the pressure probe;

converting the total pressure of the diverted flow in the alignment passageway to a static pressure and to a velocity pressure, wherein the velocity pressure results from flow along streamlines parallel to the alignment passageway;

ducting all the flow from the alignment passageway into a plenum;

impacting substantially all of the diverted portion of the flow against a sensor portion having a wall bounding the plenum to convert substantially all of the velocity pressure of the flow into static pressure in the wall region of the plenum;

sensing the static pressure of the flow in the wall region of the plenum; and

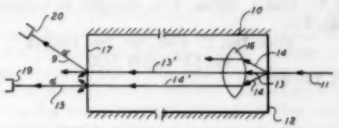
ducting all of the diverted flow away from the plenum.

4,433,585

DEVICE FOR MEASUREMENT OF THE TORSIONAL ANGULAR DEVIATION OF A LOADED ROTATING OR STATIC SHAFT

Joshua L. Levine, Ossining, N.Y., assignor to North American Philips Corporation, New York, N.Y.

Filed Dec. 21, 1981, Ser. No. 333,072
Int. Cl.³ G01L 3/08
U.S. Cl. 73—862.34 8 Claims



1. Apparatus for measuring torsional angular deviation of a member subject to torsional forces comprising first and second diffraction means mounted in spaced apart relationship to said member, a source of light, light from said source being diffracted into a first plurality of zeroth and higher order beams by said first diffraction means, the zeroth and at least one higher order beam of said first plurality of order beams being further diffracted by said second diffraction means into a second plurality of order beams, the relative positions of at least two of the order beams of said second plurality of order beams providing a measure of the torsional angular deviation of said member.

4,433,586

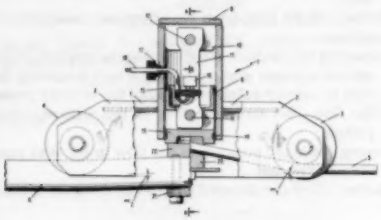
ELECTRONIC CABLE LOAD GAUGE

Hakan Öhrnell, and Leif Näslund, both of Karlstad, Sweden, assignors to Handelsbolaget Ohrneli-Teknik, Karlstad, Sweden

Filed Mar. 29, 1982, Ser. No. 362,753
Claims priority, application Sweden, Apr. 7, 1981, 8102217
Int. Cl.³ G01L 5/10
U.S. Cl. 73—862.48 1 Claim

1. An electronic cable load gauge for measuring the tension on a stretched cable or wire and generating an electric signal corresponding to the load effecting the cable, which gauge comprises a frame portion with two cable bearing members at opposite ends of the frame for engagement with the tensioned cable at one side thereof and a central portion between said bearing members engaging the opposite side of the cable to form a breaking point in which a force is generated generally transversely to the cable and corresponding to the tension load in the same, characterized in that the force detecting member comprises a measuring bar, which is arranged generally transversely to the cable, one end of which is connected to the frame portion and the other end is connected to a movable

portion which is displaceable generally transversely to the cable, said movable portion being provided with clamping means for attachment of said cable, whereby said measuring bar will be subjected to tensile stress corresponding to the tension load in the cable, the movable portion which is displaceable generally transversely to the cable comprises a piston which is slidable in a cylinder-formed part of the frame portion, and the measuring bar is made in the form of a piston rod which in one end is rotatably attached to the piston and in the other end to the frame portion.

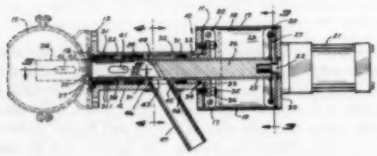


4,433,587

SAMPLER FOR FLOWING PRESSURIZED DRY MATERIAL

Norton W. Risdal, Dallas, Tex., assignor to Gustafson, Inc., Dallas, Tex.

Filed Jan. 17, 1983, Ser. No. 458,478
Int. Cl.³ G01N *1/20*
U.S. Cl. 73—863.54 **20 Claims**



1. Apparatus for collecting samples of dry material flowing under fluid pressure in a flow duct, comprising

an elongate housing with front and rear ends and a longitudinally reciprocable sample tube in the housing and extending at a significant oblique angle from horizontal, the sample tube having an upper sample collecting end to project obliquely upwardly and out of the front end of the housing and into the flow duct to which the housing may be connected, and the sample tube being retractable into the housing from the flow duct,

drive means on the housing and connected with the sample tube to rapidly project and retract the tube,

the housing having a bottom side with an outlet port therethrough and spaced from the front end of the housing, and an elongate seal in the housing and embracing the slidable sample tube between the front end of the housing and the outlet port,

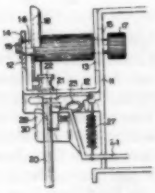
the sample tube having a sample receiving port through one side of the sample collecting end thereof to be opened as the sample collecting end projects out of the housing, and to be sealingly closed as the collecting end is retracted into the housing and seal, the sample tube also having a lower side with a discharge port therein, alternately to be opened into the outlet port of the housing when the sample tube is retracted and to be sealed closed by the seal of the housing when the tube is projected, the sample tube being continuously open and unobstructed between the receiving and discharge ports, the elongate seal spanning across both the receiving port and discharge port during retraction of the sample tube to prevent the receiving and discharge ports from being simultaneously open, and the sample tube having a sealing obstruction transversely thereacross adjacent the discharge port.

4,433,588

CLUTCH MECHANISM

Tadaaki Watanabe, and Yoshio Tanaka, both of Saitama, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Filed Jul. 27, 1981, Ser. No. 286,922
Claims priority, application Japan, Jul. 28, 1980, 55-105597[U]; Jul. 28, 1980, 55-105596[U]; Aug. 1, 1980, 55-108283[U]; Aug. 4, 1980, 55-109813[U]; Aug. 8, 1980, 55-111722[U]
Int. Cl.³ H03J *5/12*; G05G *1/02*; F16H *55/18*
U.S. Cl. 74—10.33 **6 Claims**



1. In a pushbutton-operated tuner having a frame, pushbutton means for effecting preset tuning of said tuner, a tuning shaft for effecting manual turning of said tuner and a clutch mechanism for disconnecting said tuning shaft when said pushbutton means is actuated for effecting preset tuning of said tuner, the improvement which comprises: said clutch mechanism comprises a clutch shaft, said clutch shaft having a tapered portion adjacent to the outer end thereof; a substantially U-shaped support member having an inner leg located adjacent to and mounted on said frame, said inner leg of said support member having a substantially V-shaped bearing hole therethrough, said support member having an outer leg located opposite to said inner leg and having an axially tapered circular bearing hole therethrough, said clutch shaft being supported by said support member with said tapered portion of said clutch shaft being fitted in said circular bearing hole and the inner end portion of said clutch shaft extending through said V-shaped bearing hole; a clutch gear mounted on said inner end of said clutch shaft; a clutch disk mounted on said clutch shaft close to the outer end thereof, said tuning shaft being disposed close to said clutch disk and being supported for movement between a first position in which it engages said clutch disk and a second position in which it is disengaged from said clutch disk; a spring member urging said tuning shaft toward said first position; a kick arm member movable in response to operation of said pushbutton means; and a disengaging member responsive to the movement of said kick arm member and coupled to move said tuning shaft to said second position.

4,433,589

GEAR REDUCTION ARRANGEMENT FOR VARIABLE SPEED POWER DRIVEN TOOL

Peter C. Chaconas, Glyndon, Md., assignor to Black & Decker Inc., Newark, Del.

Filed Aug. 14, 1981, Ser. No. 292,437
Int. Cl.³ F16H *35/06, 1/12, 55/17*
U.S. Cl. 74—325 **5 Claims**

1. A gear reduction arrangement for a power driven tool, comprising:

(a) a frame having a main body portion and a frame cover detachably mounted to the main body portion;

(b) a gear case cover detachably mounted to the main body

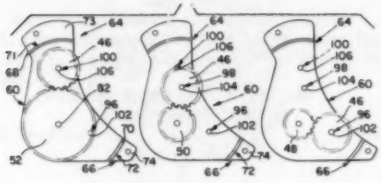
portion intermediate the main body portion and the frame cover;

(c) a driven gear of a first predetermined diameter rotatably positioned with respect to the frame;

(d) pinion gear means rotatably positioned with respect to the frame and comprising one of a plurality of pinion gears and a pinion gear shaft, said pinion gears having different diameters;

(e) an idler gear of a second predetermined diameter and having an idler gear mounting shaft;

(f) means for supporting the idler gear and the pinion gear means between the frame main body portion and the gear case cover so that the idler gear is placed in meshing interengagement with the driven gear and the pinion gear means, without requiring changing the predetermined



diameters of either the driven gear or the idler gear and without requiring changing the position of either the driven gear or the pinion gear means with respect to the frame, over a range of diameters of said plurality of pinion gears; and

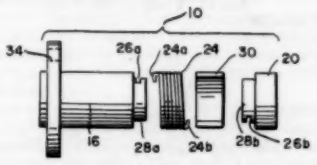
(g) the means for supporting the idler gear and the pinion gear means including aligned pinion gear mounting apertures in the gear case cover and the frame main body portion for receiving the pinion gear shaft, and further including a plurality of discrete aligned idler gear mounting apertures in the gear case cover and the frame main body portion for receiving the idler gear mounting shaft, each one of the plurality of aligned idler gear mounting apertures corresponding to said one of the plurality of the pinion gears.

4,433,590

ANTI-BACKLASH NUT ASSEMBLY

Harold P. Benoit; Leonard J. LaPasso, and Ian McBain, all of Rockford, Ill., assignors to Motion Control, Inc. and Rockford Ball Screw Co., both of Rockford, Ill.

Filed Aug. 28, 1981, Ser. No. 297,222
Int. Cl.³ F16H *55/18*
U.S. Cl. 74—409 **23 Claims**



1. An anti-backlash nut assembly for longitudinal movement along a screw which has an external thread thereon, in response to relative rotational movement between the nut assembly and screw, comprising:

a first nut part having an internal thread complementary to the external thread of said screw;

a second nut part also having an internal thread complementary to the external thread of said screw; and

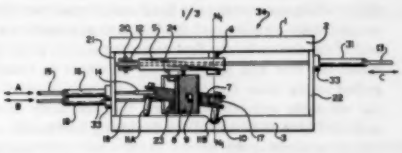
torsion means interconnected between said first and second nut parts for rotatably biasing said nut parts together to eliminate backlash and improve the positional accuracy of the nut assembly along the screw.

4,433,591

REMOTE CONTROL SYSTEM

Edward A. Green, Mantua, Ohio, assignor to Eaton Corporation, Cleveland, Ohio

Filed Nov. 16, 1981, Ser. No. 321,366
Int. Cl.³ G05G *11/00, 5/06*
U.S. Cl. 74—479 **18 Claims**



1. An improved control system for controlling at least one device remotely from either first or second operating station controls of the type comprising:

a frame;

a first body member having one end rotatably mounted on the frame and adapted to rotate in a plane with respect to the frame and having means disposed between the rotatable mounting and the opposite end thereof connecting the first body member to the device to be controlled;

a second body member rotatably mounted on the first body member between a first end and a second end thereof in such a manner that the second body member is able to rotate in a plane that is substantially parallel to the plane of rotation of the first body member, said second body member having means disposed between the first end thereof and the rotatable mounting between the first and second body members connecting the second body member to the first operating station control and having means disposed between the second end thereof and the rotatable mounting between the first and second body members connecting the second body member to the second operating station control; wherein the improvement is characterized by said system having:

means disposed on the frame and on the second body member at the point at which the second body member is connected to the first operating station control for fixedly securing the second body member against movement with respect to the frame when the first operating station control is in a neutral position and the second operating station is moved from a neutral position;

means disposed on the frame and on the second body member between the second end thereof and the rotatable mounting between the first and second body member for moveably securing the second body member to the frame when the second operating station control is in the neutral position and the first operating station control is moved from the neutral position;

said securement means moveably securing the second body member end to the frame in such a manner that movement of the first operating station control from the neutral position is able to disengage the means fixedly securing the second body member against movement with respect to the frame while maintaining the moveable securement between the second body member and the frame so as to prevent control of the device by the second operating station control and cause the second body member to rotate about the point of moveable securement between the second body member and the frame and as a result of such rotation cause the first body member to rotate about the rotatable mounting between the first body member and the frame in a direction opposite to the direction of rotation of the second body member and control the de-

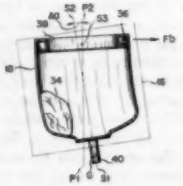
vice by movement of the means connecting the device to the first body member while permitting the point of moveable securement between the frame and the second body member to move with respect to the frame for a distance sufficient to account for the movement of the second body member caused by the rotation of the first body member; and said securement means fixedly securing the second body member against movement with respect to the frame in such a manner that movement of the second operating control from the neutral position is able to disengage the means moveably securing the second body member to the frame while maintaining the fixed securement between the second body member and the frame so as to prevent control of the device by the first operating station control and cause the first and second body members to rotate together in the same direction about the axis of rotation of the rotatable mounting between the first body member and the frame and control the device by movement of the means connecting the device to the first body member.

4,433,592

BALANCER FOR USE IN CENTRIFUGAL ROTARY MACHINE

Hisao Tatsumi, and Michiaki Ito, both of Nagoya, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Aug. 24, 1982, Ser. No. 411,005
Claims priority, application Japan, Aug. 26, 1981, 56-133628
Int. Cl.³ F16F *15/22*; D06F *37/24*
U.S. Cl. 74—573 F **9 Claims**



1. A balancer used in a centrifugal rotary machine for reducing the vibration of support means for supporting a cylindrical rotary tub, which occurs due to the existence of an unbalanced load in the rotary tub, comprising:

an annular casing having an annular receiving chamber therein and attached to the rotary tub coaxially;

a low-viscous operating liquid cirumferentially and flowably sealed in the annular receiving chamber and, as the rotary tub rotates, flowing to the side opposite to that on which the unbalanced load of the rotary tub is located to absorb the unbalance of the rotary tub; and

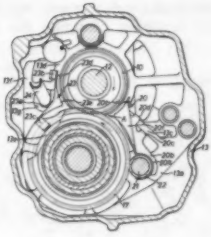
a plurality of spherical weights circumferentially movable disposed in the annular receiving chamber and, as the rotary tub rotates, moved to the side opposite to that on which the unbalanced load of the rotary tub is located to absorb the unbalance of the rotary tub, each spherical weight being formed of an elastic material containing powdered lead oxide.

4,433,593

GEAR-TEETH PROTECTOR IN CHANGE-SPEED GEARING UNITS

Kazuhito Ikemoto; Nobuaki Katayama; Yukio Terakura, all of Toyota, and Kan Sasaki, Aichi, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Apr. 15, 1981, Ser. No. 254,266
Claims priority, application Japan, Sep. 20, 1980, 55-117921[U]
Int. Cl.³ F16H *57/02*
U.S. Cl. 74—606 R **3 Claims**



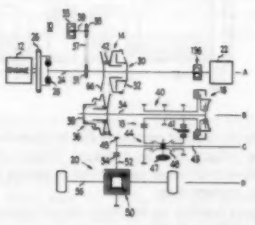
1. In a transmission having a housing, an upright wall within said housing, upper and lower change-speed gears arranged in a common vertical plane adjacent to and parallel to the plane of said upright wall and having teeth in meshing engagement with each other, and an oil transfer trough fixed to said upright wall and extending in an axial direction in said housing, a gear-teeth protector comprising first and second shroud plates arranged at both sides of said change-speed gears and forming a pair of side walls enclosing the meshing engagement portion between said two change-speed gears to prevent metallic alien particles being trapped between said change-speed gears, said first shroud plate having a pair of lugs resiliently engaged with said upright wall to prevent rotation of said first shroud plate and a collar member secured to its lower end and pressedly mounted within an axial bore in said upright wall to fasten said first shroud plate in place, and said second shroud plate being secured in place to an intermediate portion of said oil transfer trough and having a pair of lugs resiliently engaged with said upright wall to prevent rotation of said second shroud plate.

4,433,594

VARIABLE PULLEY TRANSMISSION

Richard L. Smirl, Arlington Heights, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Apr. 24, 1981, Ser. No. 257,283
Int. Cl.³ F16H *37/00, 37/08*
U.S. Cl. 74—689 **21 Claims**



1. A transmission mechanism comprising an input shaft, a continuously variable drive system having an input pulley, an output pulley, and a belt means extending between said pulleys to transfer power, each of said input and output pulleys having an axially fixed sheave and an axially movable sheave, means

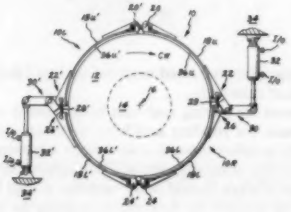
connecting said fixed sheave of the input pulley to said input shaft, a second shaft, means connecting said fixed sheave of the output pulley to said second shaft, a slippable, fluid-actuated, fluid cooled, starting clutch mounted on said second shaft, a sleeve concentric with, and rotatable with respect to, said second shaft, said sleeve being connected to said clutch, a third shaft, means for providing a driving connection between said second and third shafts including a forward-reverse gear selection means having a forward driving gear and a reverse driving gear connected to said sleeve, and final drive means drivingly connected to said third shaft, said starting clutch, when engaged, connecting the second shaft to said forward-reverse gear selection means, whereby said belt can continuously rotate said pulleys.

4,433,595

PRECISION ROTOR INDEXING DEVICE

Hugh E. Rosa, Schenectady, and Allen A. Slaterpryce, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Sep. 30, 1981, Ser. No. 307,030
Int. Cl.³ B23Q *17/00*
U.S. Cl. 74—813 L **9 Claims**



1. Apparatus for indexing a rotor member of the type having a cylindrical surface, comprising:

a metallic circular band fittable to encircle said cylindrical surface;

first and second discontinuities spaced 180 degrees apart in said circular band;

first and second attachment points at extremities of said circular band at said first discontinuity;

third and fourth attachment points at extremities of said circular band at said second discontinuity;

a first self-locking compound linkage assembly joining said first and second attachment points;

a second self-locking compound linkage assembly joining said third and fourth attachment points;

said first self-locking compound linkage assembly including first means for locking said circular band to said rotor member in response to a first force applied in a first tangential direction to said first self-locking compound linkage assembly and for releasing said circular band in response to a second force applied thereto in a second tangential direction;

said second self-locking compound linkage assembly including second means for locking said circular band to said rotor member in response to said first force applied in said first tangential direction to said second self-locking compound linkage assembly and for releasing said circular band in response to said second force applied thereto in said second tangential direction;

a first linear actuator effective to apply a selected one of said first and second forces to said first self-locking compound linkage assembly;

a second linear actuator effective to apply a same one of said first and second forces to said second self-locking compound linkage assembly whereby said cylindrical surface receives substantially equal tangential forces spaced 180 degrees apart for imparting pure rotating moment to said rotor member; each said self-locking compound linkage assembly comprising two links pivotally secured to each other, a first one of said links being pivotally secured to one of said first or third attachment points and a second of said links being pivotally secured to one of said second or fourth attachment points, each of said linear actuators being pivotally secured to a respective one of said links; and

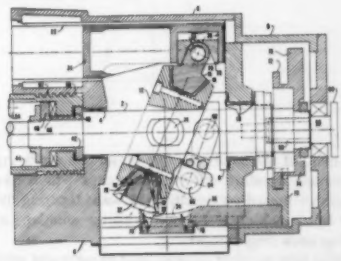
said first and second linear actuators being further effective, when said first force is applied to said first and second self-locking compound linkage assemblies thereby locking said circular band to said cylindrical surface, to continue substantially linear motion whereby a controlled unidirectional rotation of said rotor member is produced.

4,433,596

WABBLER PLATE ENGINE MECHANISMS

Joseph Scalzo, 26, Florence Ave., Kew, Melbourne, Victoria 3101 Australia

Filed Mar. 13, 1981, Ser. No. 243,411
Claims priority, application United Kingdom, Mar. 11, 1980, 8008264
Int. Cl.³ F16H *35/08, 1/28, 23/00;* F01B *3/00*
U.S. Cl. 74—839 **13 Claims**

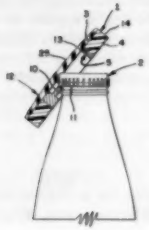


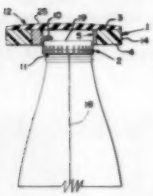
1. A wabbler plate engine mechanism comprising a crankcase having a crankshaft rotatable therein, the crankshaft being slidably coupled to an output shaft; a wabbler carrier obliquely mounted on the crankshaft and coupled by a flexible linkage to a connection fixed axially in relation to the crankcase, the linkage causing alteration of the angle between the crankshaft axis and the wabbler carrier, and thereby the stroke of the mechanism as the crankshaft is shifted relative to the output shaft; and a wabbler plate rotatably mounted on the carrier; a plurality of cylinders arranged around the crankshaft with pistons reciprocally moveable therein along axes substantially parallel to the rotational axis of the crankshaft; the wabbler plate having arms extending radially therefrom to bearings coupling each arm to a piston, each bearing permitting lateral movement of the respective arm relative to the axis of the piston; a stabilizer mechanism operating between the wabbler plate and the crankcase comprising ball races formed in juxtaposed curved surfaces of the wabbler plate and a ball race carrier on the crankcase, and a ball confined at the intersection of the ball races; and means comprising a screw threaded member mating with a corresponding thread in the crankcase around the crankshaft axis and coupled to the crankshaft and operable to shift the crankshaft axially and thereby the rotational axis of the wabbler plate, the crankshaft being connected to the ball race carrier on the crankcase such that the center of the carrier is always perpendicularly aligned with the rotational axis of the wabbler plate, the effective lengths of the ball races of the stabilizer being variable to accommodate such alteration of the angle between the crankshaft axis and the wabbler carrier.

4,433,597
COMBINED BOTTLE CAP OPENER

David A. Rowland, P.O. Box 2823, So. San Francisco, Calif. 94080

Filed Jan. 15, 1982, Ser. No. 339,766
Int. Cl.³ B67B 7/44, 7/16, 7/18
U.S. Cl. 81—3.1 R 10 Claims





1. A palm of the hand operable bottle cap removing device for removing standard crown bottle caps which have a top wall and downwardly extending sidewalls tapering outwardly from a bottle which is formed with an annular outwardly extending neck ring comprising:

a. a rigid base member dimensioned to surround said tapered bottle cap and having top and bottom walls;

b. an opening generally formed in the center of said base having sidewalls with at least three circumferentially spaced points on said sidewall dimensioned to receive the top portion of said tapered cap therethrough and adapted for frictional registration with the outer tapered sidewalls of said cap for twisting off said cap upon rotation of said base member;

c. a tang member protruding axially inwardly from a wall of said opening and inset in from said bottom wall and adapted for engagement with the bottom edge of said bottle cap for pry-off removal of said cap; while said sidewalls of said opening in said device engage said outwardly tapering cap sidewalls which provide the fulcrum for said device; and

d. a top member connected to said top wall of said base member covering said opening and said top wall of said base member providing a relatively large uninterrupted surface for use in carrying a logo or commercial message.

4,433,598
RING JOINT MACHINING TOOL

Jack T. Murray, San Jose, Calif., assignor to United Centrifugal Pumps, San Jose, Calif.

Filed Mar. 15, 1982, Ser. No. 357,987
Int. Cl.³ B23B 5/16
U.S. Cl. 82—2 E 6 Claims

1. A ring joint machining tool for machining the sides of a ring joint in a fixed workpiece comprising in combination:

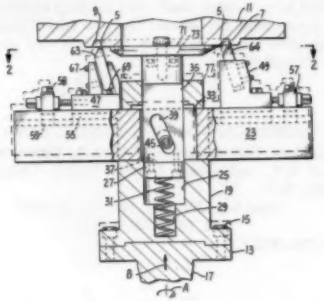
(a) a body member mounted for rotation at right angles to a workpiece,

(b) a tool block mounted in sliding relationship in said tool block at a right angle to the axis of rotation,

(c) a pair of tool holders on said tool block one mounted on each side of said body member, each holder having a cutting tool therein,

(d) a cam body having an angling slot mounted for sliding axial movement in said body member,

(e) a cam follower mounted on said tool block and extending into the slot of the cam body,



(f) a stop plate mounted between said tool holders attached to said cam body,

(g) means for biasing said cam body toward a workpiece,

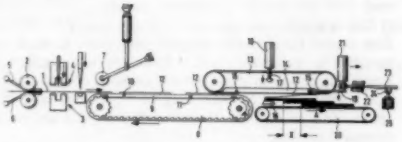
(h) means for rotating said body member and moving said body member toward a workpiece whereby,

(i) said stop plate engages said workpiece moving said stop plate relative to said body member as said body member moves toward the workpiece, pushing on said cam body causing said tool block to move in a radial direction.

4,433,599
APPARATUS FOR FORMING AND STACKING SECTIONS SEVERED FROM A WEB OF TUBULAR FILM

Friedhelm Mundus, and Fritz Achelpohl, both of Lengerich, Fed. Rep. of Germany, assignors to Windmoller & Holscher, Lengerich, Fed. Rep. of Germany

Filed Oct. 21, 1981, Ser. No. 313,624
Claims priority, application Fed. Rep. of Germany, Oct. 23, 1980, 3040021
Int. Cl.³ B31B 1/98
U.S. Cl. 83—87 4 Claims



1. Apparatus for forming stacks from sections severed from a web of tubular film or a web of material or weld-separated bag or sack workpieces, comprising transverse means for severing sections from the intermittently advanced web of material and means for clamping each severed section, a suction belt conveyor which receives the severed sections and said belts are provided with suction holes at a spacing larger than the length of the sections, and a pressure roller which can be moved towards and raised off the receiving end of the suction belt conveyor in sequence with the release of the clamping means and the pressing-on motion is so synchronised with the passage of the suction holes that the trailing portion of each section is suction-attracted by the suction holes, characterised in that the suction belt conveyor which conveys with its upper

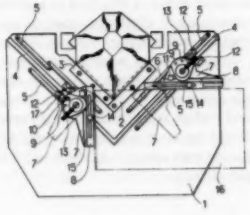
run has its end portion partially covered by a second suction belt conveyor which takes over the sections and conveys same with its lower run and the belts are likewise provided with suction holes at a spacing corresponding to the spacing of the suction holes of the first suction belt conveyor for suction-attracting the leading portions of the sections supplied by the first suction belt conveyor, and an intermittently driven stacking belt conveyor is provided under the second suction belt conveyor, on which the sections are deposited by means for withdrawing same from the second belt conveyor.

4,433,600

WORKPIECE LOCATING DEVICE FOR A CORNER SHEAR MACHINE

Chihiro Ikeda, Tatsukuchi, Japan, assignor to Takeda Machinery Works Company, Ltd., Ishikawa, Japan

Filed Jun. 7, 1982, Ser. No. 386,079
Int. Cl.³ B26D *7/01*
U.S. Cl. 83—468 **6 Claims**



1. A workpiece locating device for a corner shear machine by which a V-shaped notch is sheared in a predetermined position at a corner or on one side of a workpiece in the form of a square or rectangular sheet material, wherein the device comprises a pair of grooves formed in parallel to the cutting edges of the dies fixedly secured onto a table and extending at a right angle relative to one another, said grooves extending symmetrically relative to the dies, a pair of corner shearing scales fixedly mounted on the table in the vicinity of the grooves and in parallel to the latter, said corner shearing scales including a number of calibrated lines extending at a right angle relative to the cutting edges of the dies and being arranged symmetrically relative to the dies, pairs of side shearing scales fixedly mounted on the table in the vicinity of the grooves and in parallel to the latter, said side shearing scales including a number of calibrated lines extending at a right angle relative to the cutting edges of the dies and being arranged symmetrically relative to the dies, and a pair of rotary stoppers mounted slidably along the grooves.

4,433,601

ORCHESTRAL ACCOMPANIMENT TECHNIQUES

George R. Hall, Sherman Oaks; Robert J. Hall, Chatsworth, and Jack C. Cookerly, Saugus, all of Calif., assignors to Norlin Industries, Inc., White Plaines, N.Y.

Continuation of Ser. No. 3,584, Jan. 15, 1979, abandoned. This application Sep. 30, 1981, Ser. No. 307,161
Int. Cl.³ G10F *1/00*
U.S. Cl. 84—1.03 **52 Claims**

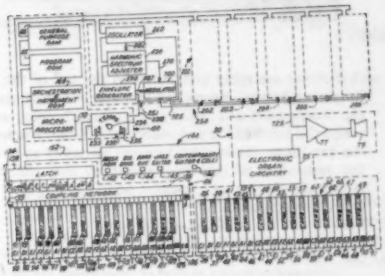
1. Electronic musical apparatus for enabling a performer to control the production of at least first and second musical accompaniments including notes having an instrumentation pattern, said apparatus comprising in combination:

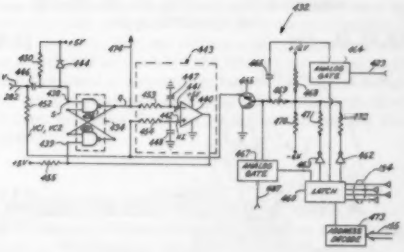
memory means for storing a first plurality of music signals defining at least in part the first musical accompaniment and a second plurality of music signals defining at least in part the second musical accompaniment;

selection means operative during the performance for generating a first selection signal in response to selection of the first musical accompaniment by the performer and for generating a second selection signal in response to selection of the second musical accompaniment by the performer;

harmony selection means for enabling the performer to select at least one harmony from a plurality of different harmonies;

processing means responsive to the generating of the first selection signal and one harmony for generating a first set of parameter signals based at least in part on the first plurality of music signals, said first set of said parameter signals defining a first segment of music including a plurality of pitched accompaniment notes arranged in the one





harmony and having a first instrumentation pattern and for modifying the first set of parameter signals during the performance in response to the generating of the second selection signal and one harmony in order to generate a second set of parameter signals based at least in part on the second plurality of music signals, said second set of parameter signals defining a second segment of music having a second instrumentation pattern different from the first instrumentation pattern; and

output means for converting the parameter signals to sound, whereby a performer of limited skill or musical knowledge can play a musically-variable accompaniment to a melody written in any one of a variety of musical keys.

4,433,602

KEYBOARD MUSICAL INSTRUMENT

Paul de Vries, 38 W. 10th St., New York, N.Y. 10011

Continuation-in-part of Ser. No. 95,558, Nov. 19, 1979, Pat. No. 4,314,494. This application Feb. 5, 1982, Ser. No. 346,026
The portion of the term of this patent subsequent to Feb. 9, 1999, has been disclaimed.
Int. Cl.³ G10H *3/00*
U.S. Cl. 84—1.06 **10 Claims**

1. A keyboard musical instrument comprising:

supporting means;

a plurality of sound producing elements, each attached to the supporting structure;

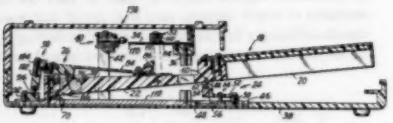
a plurality of actions, each being associated with an element; each action including

a key having a head and a tail,

a hammer assembly including a hammer mounted on the key tail,

an escapement,

and flexible and resilient key hinge means for connecting the key to the supporting structure;



said hammer assembly connected to the tail of the key by hinge and biasing means and when at rest in contact with the escapement and initially restrained thereby, whereby when the key head is depressed the key tail rotates about the key hinge causing the hammer assembly to overcome the resistance of the escapement so that the hammer strikes the element at a specific point causing it to vibrate and produce sound.

4,433,603

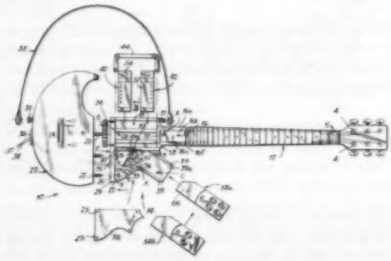
COMPONENT MUSICAL INSTRUMENT

Roger Siminoff, 112 Privada Luisita, Los Gatos, Calif. 95030

Continuation of Ser. No. 146,682, May 5, 1980, abandoned. This application Nov. 24, 1982, Ser. No. 444,449

Int. Cl.³ G10H *3/00*

U.S. Cl. 84—1.16 **12 Claims**



1. A stringed musical instrument definable by the musician by assembly of tone producing playing strings and at least one each of the following types of discrete, interchangeable components, without need for hand tools to accomplish said assembly, said types comprising:

a. elongated neck section means for mounting at one end thereof a plurality of tuning means for tensioning each of said plurality of playing strings, said neck section means having first neck attachment means for enabling demountable attachment at another end thereof to main center section means, and defining an elongated fingerboard playing region between said ends thereof,

b. end body section means for demountably attaching said strings at ends thereof opposite said tuning means at a common string mounting and demounting location and having first end body attachment means for enabling demountable attachment thereof to said main center section means,

c. said main center section means comprising an elongated central body portion disposable between said elongated neck section means and said end body section means and defining second neck attachment means for demountably engaging said first neck attachment means at a first end region thereof and defining second end body attachment means for demountably engaging said first end body attachment means at a second end region thereof, said body portion defining a recessed longitudinal region lying between said first and second end regions thereof and directly below said strings, said region extending to and along an edge of said body portion between said first and second end regions, said body portion providing contact means in said recessed longitudinal region for attachment and electrical connection with at least one plug-in inductive pickup module means, said body portion further defining a chamber at an edge location generally opposite to said recessed region, for receiving electrical control module means, said body portion providing electrical connection means with said control module means when in said chamber, said connection means including circuit paths to said electrical contact means,

d. at least one plug-in inductive pickup module means for plug-in attachment to and removal from said body portion and having electrical contacts for engaging said electrical contact means and having inductive pickup transducer means aligned adjacently below said strings when said pickup module means is attached to said body portion, and

e. at least one plug-in electrical control module means for attachment to said body portion in said chamber and for thereby connecting to a said attached pickup module means, said control module means for controlling electrical signals generated by said pickup module means,

whereby said pickup module means may readily be removed and replaced by the musician independently of removing and replacing said control module and without demounting of said strings.

4,433,604

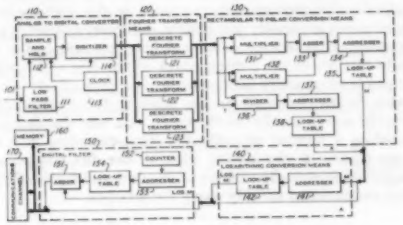
FREQUENCY DOMAIN DIGITAL ENCODING TECHNIQUE FOR MUSICAL SIGNALS

Granville E. Ott, Lubbock, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Sep. 22, 1981, Ser. No. 304,470

Int. Cl.³ G10H *1/02*

U.S. Cl. 84—1.19 **40 Claims**



1. An apparatus for communicating musical signals comprising;

analog to digital conversion means for receiving an analog signal representing a musical signal and converting the analog signal into a corresponding plurality of first digital data words, each of the first digital data words representing the amplitude of the audio signal at a corresponding one of a plurality of sampling intervals;

Fourier transform means connected to the analog to digital conversion means for converting successive selected sets of successive first digital data words into corresponding sets of a plurality of second digital data words, each of the second digital data words representing a complex number discrete Fourier transform coefficient of a corresponding frequency of at least one set of frequencies, each set of frequencies including a primary frequency and only frequencies octavely related thereto and excluding harmonics which are not octavely related to said primary frequency,

communication means connected to the Fourier transform

means for transmission of digital data words applied thereto;

inverse Fourier transform means connected to the communication means for converting sets of digital data words transmitted by the communication means into successive sets of third digital data words, each third digital data word representing the amplitude of an analog signal at a corresponding one of a plurality of sampling intervals; and

digital to analog conversion means converted to the inverse Fourier transform means for converting the plurality of third digital data words into a corresponding analog signal.

29. An apparatus for decoding digital data words representing musical signals comprising:

receiving means for receiving first digital data words representing complex number discrete Fourier transform coefficients for at least one set of frequencies, said at least one set of frequencies including a primary frequency and only frequencies octavely related thereto and excluding harmonics which are not octavely related to said primary frequency;

inverse Fourier transform means connected to the receiving means for converting successive selected sets of said first digital data words into corresponding sets of second digital data words, each second digital data word representing the amplitude of an analog signal at a corresponding one of a plurality of sampling intervals; and

digital to analog conversion means connected to the inverse Fourier transform means for converting the sets of second digital data words into a corresponding analog signal.

4,433,605

FIXTURE FOR STRING RETAINER OF THE STRINGS

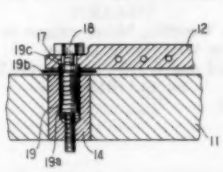
Kazuhiro Matsui, Toyoake, Japan, assignor to Hoshino Gakki Co., Ltd., Nagoya, Japan

Filed Mar. 30, 1982, Ser. No. 363,606

Claims priority, application Japan, Aug. 5, 1981, 56-116425[U]

Int. Cl.³ G10D *3/12*

U.S. Cl. 84—299 **4 Claims**



1. A fixture apparatus for fixing a string retainer to the body of a musical instrument and for adjusting the height of the string retainer, said device comprising:

(a) an embedded nut fixed to said body, said embedded nut having a large-diameter female thread on the upper portion and a small-diameter female thread on the lower portion;

(b) a fixing bolt having a male thread corresponding to said small-diameter female thread, inserted into a fixing hole in said string retainer, wherein a head portion of said bolt contacts the upper surface of a fringe of said fixing hole; and

(c) an adjusting bolt having a male thread corresponding to said large-diameter female thread and having an inserting through hole in the center thereof, wherein the upper surface of said adjusting bolt contacts with the lower surface of the fringe of said fixing hole, said adjusting bolt being screwed into said embedded nut, and wherein said string retainer is positioned to keep the lower surface of the fringe of said fixing hole in contact with the upper surface of said adjusting bolt, and said fixing bolt is screwed into said embedded nut, passing through said inserting through hole of said adjusting bolt, whereby said string retainer is held between said fixing bolt and said adjusting bolt and fixed to the body of said musical instrument.

4,433,606

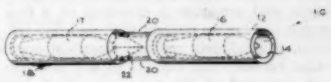
TANDEM ROCKET LAUNCHER

Allen C. Hagelberg, Diamond Bar, and Clark E. Allardt, Claremont, both of Calif., assignors to General Dynamics, Pomona Division, Pomona, Calif.

Division of Ser. No. 133,756, Mar. 25, 1980, Pat. No. 4,342,252. This application Sep. 4, 1981, Ser. No. 299,362

Int. Cl.³ F41F *3/06*; F42C *15/06*

U.S. Cl. 89—1.812 **4 Claims**



1. In a tandem rocket launcher means for positioning plural axially aligned rockets having exhaust means interspersed along a tube for exhausting rocket gases from a first rocket before they impinge a second rocket behind the first, the improvement comprising:

a conical exhaust gas deflector adjacent the gas exhausting means effective to prevent launched rocket exhaust gas flow from said first rocket toward said second rocket by directing said gases out of said exhaust means interspersed along said tube, said gas deflector being bifurcated with each half rotatable toward the interspersed means about axes positioned external to the base of the conical deflector for symmetrically dispersing said exhaust gas flow, thereby providing for even back pressure on said first rocket.

4,433,607

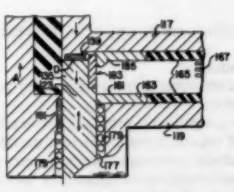
SWITCH FOR VERY LARGE DC CURRENTS

George A. Kemeny, Wilkins Township, Allegheny County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 6, 1981, Ser. No. 309,290

Int. Cl.³ F41F *1/02*; H02K *41/02*

U.S. Cl. 89—8 **24 Claims**



3. A projectile launching assembly comprising:

a first pair of generally parallel electrically conductive rails mounted in spaced parallel relationship in a common plane with a gap therebetween;

means for generating a DC current connected to one end of said first rails;

a switch comprising:

an elongated armature, and

means for mounting said elongated armature for rectilinear movement in said common plane from a first position in which the armature bridges said gap and is in electrical contact with both of said first pair of rails to conduct between said first pair of rails a current applied to the first pair of rails at one end thereof, and a second position in which electrical contact between at least one of said first

pair of rails and said armature is broken to interrupt the flow of current through the armature and to inject into the gap, for travel along the first pair of rails toward the second ends thereof, an arc created as contact between said armature and one of said first pair of rails is broken, wherein the other rail defines a recess in which said armature is mounted with said armature in electrical contact with at least one wall of said recess;

a second set of parallel launcher rails with a first end of each rail of said second set connected to one of the rails of said first set;

a projectile placed between and in sliding contact with each of said second pair of rails, said projectile being accelerated toward and ejected from the second ends of said second set of rails when said armature is moved to interrupt the flow of current therethrough; and

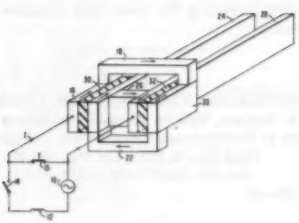
wherein said armature is provided on a free end, which makes and breaks contact with said one rail, with an arc horn, and wherein resilient electrical contacts are provided between said one rail of said first pair of rails and said free end of the armature, which break electrical contact between said one rail and said free end of the armature progressively along said free end from a point remote from the arc horn toward the arc horn.

4,433,608

ELECTROMAGNETIC PROJECTILE LAUNCHER WITH AN AUGMENTED BREECH

Daniel W. Deis, Churchill Borough; Ian R. McNab, Murrysville, both of Pa., and Joseph L. Smith, Jr., Concord, Mass., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 3, 1981, Ser. No. 327,154
Int. Cl.³ F41F *1/02*; H02K *41/02*
U.S. Cl. 89—8 **17 Claims**



1. An electromagnetic projectile launching system comprising:

a first conductor;

a second conductor disposed generally parallel to said first conductor;

means for propelling a projectile from a breech end of said first and second conductors to a muzzle end thereof and for conducting current therebetween;

a third conductor disposed generally parallel and adjacent to the breech end of said second conductor and being electrically connected to said first conductor adjacent said breech end thereof;

a fourth conductor disposed generally parallel and adjacent to the breech end of said first conductor and being electrically connected to said third conductor at an end opposite said third conductor's connection to said first conductor;

a source of current electrically connected to the breech end of said fourth conductor and to the breech end of said second conductor;

circuit breaking means electrically connected in parallel with said current source, whereby the current required for launching the projectile is rapidly commutated to said fourth and second conductors and is at a lower value than required utilizing a single pair of conductors to achieve the same amount of force on a projectile; and

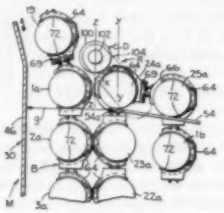
each of said third and fourth conductors having a length which is less than the distance traveled by said means for propelling while current in said first and second conductors is increasing.

4,433,609

SUSPENDED LOOP AMMUNITION MAGAZINE

Larry N. Darnall, Santa Clara, Calif., assignor to FMC Corporation, Chicago, Ill.

Filed Aug. 17, 1981, Ser. No. 293,802
Int. Cl.³ F41D *10/14*
U.S. Cl. 89—34 **4 Claims**



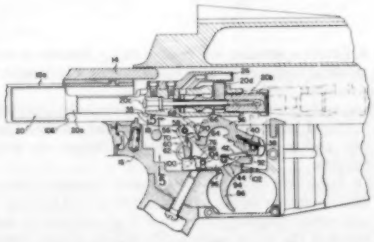
1. An ammunition magazine for suspended loop stowage of ammunition rounds connected by an articulated belt, said magazine comprising a relatively deep box having side walls and a front wall, generally horizontal, continuous side rails along an upper portion of said box side walls for slidably suspending the end rounds of each loop, and roller means for applying a resilient downward and rearward restraining force on a round supported on the forward end portions of said rails against forward sliding motion of said round along the rails until pulled upwardly and forwardly off said rails and away from said roller means.

4,433,610

OPEN BOLT FIRING MECHANISM FOR AUTOMATIC FIREARM

Henry J. Tatro, Westfield, Mass., assignor to Colt Industries Operating Corp, West Hartford, Conn.

Filed Aug. 6, 1981, Ser. No. 290,724
Int. Cl.³ F41D *11/02*
U.S. Cl. 89—148 **8 Claims**



1. In an automatic firearm having a receiver, an open bolt firing mechanism of the type having a bolt assembly mounted in the receiver for longitudinal reciprocating movement between rearward recoil and forward battery positions, a sear abutment on the bolt assembly, a hammer, having a sear abutment, mounted in the receiver for pivoting movement between retracted and fired positions and urged to the retracted position by the bolt assembly during its movement between the battery and recoil positions, an automatic sear, having a searing surface to engage the sear abutment on the hammer, mounted in the receiver for downward and upward pivoting movement

and for retaining the hammer in a cocked position intermediate the retracted and fired positions and releasing the hammer from the cocked position thereof as the bolt assembly moves into the battery position and a trigger mounted in the receiver for pivoting movement between extended and depressed positions for releasing the bolt assembly from a cocked position intermediate the retracted and battery positions, the improvement in the open bolt firing mechanism comprising:

a searing surface on the hammer to engage the sear abutment on the bolt assembly for stopping forward movement of the bolt assembly from the recoil position such that the bolt assembly assumes its cocked position and for maintaining the bolt assembly in its cocked position; and

the automatic sear being operatively connected to the hammer when the bolt assembly is resting in its cocked position such that downward pivoting of the automatic sear produces movement of the hammer toward the retracted position and ultimately disengagement of the sear abutment of the bolt assembly and the searing surface on the hammer, whereby the bolt assembly may move forwardly into the battery position, the searing surface on the automatic sear engaging the sear abutment on the hammer subsequent to the disengagement of the sear abutment of the bolt assembly and the searing surface on the hammer.

4,433,611

GAS PISTON OPERATED AUTOMATIC HAND WEAPON

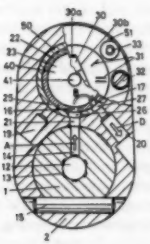
Jürgen Baumann, Lottstetten, Fed. Rep. of Germany, assignor to SIG Schweizerische Industrie-Gesellschaft, Nuhausen am Rheinfall, Switzerland

Filed Dec. 8, 1981, Ser. No. 328,670

Claims priority, application Switzerland, Dec. 30, 1980, 9647/80

Int. Cl.³ F41D *5/08*

U.S. Cl. 89—193 **16 Claims**



1. An automatic hand weapon comprising:

(a) a barrel having a longitudinal barrel bore for guiding a projectile;

(b) a gas cylinder tube mounted on said barrel and having a work chamber;

(c) inlet channel means for introducing propellant gas from said barrel bore to the work chamber;

(d) outlet channel means comprising separate first and second outlet channels for discharging propellant gas from the work chamber into the ambient atmosphere;

(e) an insert sleeve rotatably supported within said cylinder tube and defining said work chamber; said insert sleeve having

(1) first and second circumferentially spaced ports of unlike diameters;

(2) a first angular position in which said second port forms part of said inlet channel means and said first port is in registry with said first outlet channel for connecting said first outlet channel with said work chamber;

(3) a second angular position in which said first port forms part of said inlet channel means and said second port is in registry with said second outlet channel for connecting said second outlet channel with said work chamber;

(f) setting means for arbitrarily moving said insert sleeve into one of said angular positions; and

(g) a gas piston slidably received in said insert sleeve for executing work strokes from a position of rest for operating breechblock components of the weapon; said piston maintaining communication between said work chamber and the ambient atmosphere through said outlet channel means during at least one part of each work stroke; said gas piston having

(1) an end face exposed to the gas pressure in said work chamber, whereby a force is imparted to said piston for executing the work strokes;

(2) a lateral face being in a sliding engagement with a wall of said insert sleeve; and

(3) a piston bore provided through said piston and having a first opening in said lateral face and a second opening in said end face; in said position of rest of said piston said first opening being in registry with said inlet channel means whereby said piston bore maintains communication between said inlet channel means and said work chamber in said position of rest.

4,433,612

SAFETY CONTROL DEVICE FOR PROTECTING HYDRAULICALLY HELD LOADS AGAINST UNCONTROLLED PRESSURE OVERLOADING

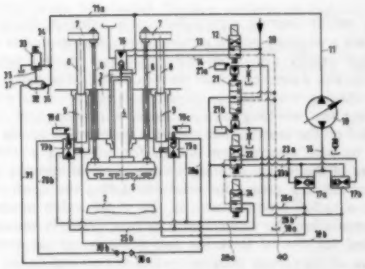
Harry Spielvogel, Dusseldorf, and Heinz Schedler, Heidesheim, both of Fed. Rep. of Germany, assignors to SMS Schloemann-Siemag Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Feb. 26, 1981, Ser. No. 238,438

Claims priority, application Fed. Rep. of Germany, Mar. 4, 1980, 3008130

Int. Cl.³ B30B *9/32*; F15B *11/16, 13/06*

U.S. Cl. 91—514 **12 Claims**



1. In a hydraulic system comprising at least one working cylinder for applying to a load a working force in a first direction, at least one further cylinder arranged to apply to said load a retraction force in a direction opposite to the first direction, and respective hydraulic pressure fluid supply conduits communicating with said at least one working cylinder and with said at least one further cylinder for selectively operating said cylinders for applying to the load the said working force or the said retraction force, the improvement in a safety system comprising:

a pressure relief valve having a fluid flow inlet communicating with the hydraulic fluid supply side of said at least one working cylinder, and a control pressure inlet communicating with a source of control pressure which opens said valve against a predetermined pressure setting to permit pressure-relieving fluid flow therethrough in response to a control pressure exceeding said predetermined pressure setting of said relief valve;

non-return valve means having a first inlet operably connected to said further-cylinder by a first conduit means, a second inlet operably connected by a second conduit

means to the fluid supply conduit of the working cylinder, and an outlet connected to said control pressure inlet of said relief valve,

so that said relief valve opens in response to control pressure which is the greater or the respective pressures at said first and second inlets and terminates operation of the working cylinder when the pressure in said further cylinder, applied through said first conduit means and said first inlet and said outlet, exceeds said predetermined pressure setting.

4,433,613

POWER STEERING SYSTEM FOR MOTOR VEHICLES

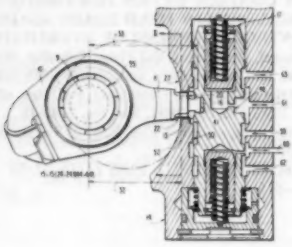
Reinhold Abt, Stuttgart; Walter Blum, Bedburg, and Jaromir Bordovsky, Bergtea, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Nov. 30, 1981, Ser. No. 325,867

Claims priority, application Fed. Rep. of Germany, Nov. 29, 1980, 3045113

Int. Cl.³ F15B *9/10, 13/16*

U.S. Cl. 91—358 R **14 Claims**



1. A power steering system for motor vehicles, the system including a working piston means, a steering nut means rotatably and axially non-displacably mounted in said working piston means, a steering worm means connected to and rotated by the steering nut means, a cylinder housing means for accommodating the working piston means, a control arm means provided on the steering nut means, a spool valve means actuatable by said control arm means for adjusting a working pressure of the power steering system, a radial opening in the cylinder housing means for accommodating the control arm means, a radial recess means in the spool valve means for accommodating the control arm means, wherein means are provided for one of lowering and shutting off the working pressure of the power steering system in two end stroke positions of the working piston means such means including first follower means provided on the control arm means and second follower means provided on a portion of the cylinder housing means, the first follower means having a zero motion with respect to a longitudinal center axis of the working piston means and the second follower means having a zero motion with respect to a longitudinal center axis of the cylinder housing means, and the first and second follower means are arranged such that a mutual engagement of the respective follower means results in actuation of the spool valve means.

4,433,614

VACUUM BOOSTER DEVICE

Hiroo Takeuchi, Asashina; Nobuaki Hachiro, and Yoshihisa Miyazaki, both of Ueda, all of Japan, assignors to Nissin Kogyo Kabushiki Kaisha, Nagano, Japan

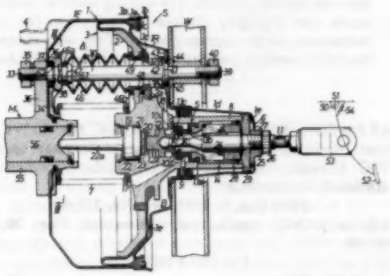
Filed Jun. 3, 1981, Ser. No. 269,985

Claims priority, application Japan, Sep. 18, 1980, 55-129633

Int. Cl.³ F15B *9/10*

U.S. Cl. 91—376 R **1 Claim**

1. In a vacuum booster device comprising a booster shell, a booster piston axially slidably accommodated in said booster shell, first and second working chambers defined in said booster shell separately from each other by said booster piston, said first working chamber being held in communication with a vacuum source, said second working chamber being selectively placed in communication with said first working chamber or the atmosphere through a control valve means, an input rod arranged in said booster piston for forward and rearward movement and connected to said control valve means so as to produce a pressure difference between both of said first and second working chambers effective to cause said booster piston to follow the forward movement of said input rod, tie rod means extending through said booster piston for connection of front and rear walls of said booster shell, sealing means arranged between said tie rod means and said booter piston to allow the operation of said piston, and a return spring compressed in said first working chamber for biasing said booster piston in its retracting direction,



the improvement which comprises a spring retainer plate supporting the fixed end of said return spring, said spring retainer plate being abutted against the front wall of said booster shell and having a pair of bosses integrally projected at its both ends, each of said bosses being provided at its inner end with an intercepted round concave hole; said tie rod means including at least two tie rods having integral mounting bolts formed at ends thereof so as to project outwardly of said booster shell, said tie rods each having an intercepted round flange disposed thereon, said spring retainer plate being fixed to said front wall by the two tie rods penetrating through said bosses thereby preventing relative rotation of the spring retainer plate with respect to the front wall of the booster shell, the intercepted round flange of each of the tie rods being fitted in the intercepted round concave hole formed on each of the bosses thereby holding each tie rod in a rotation-proof manner.

4,433,615

BLOCKING AND THERMAL RELIEF VALVE

Ralph L. Vick, Granada Hills, Calif., assignor to The Bendix Corporation, Southfield, Mich.

Filed Oct. 22, 1981, Ser. No. 313,896

Int. Cl.³ F15B *13/042*

U.S. Cl. 91—420 **6 Claims**

1. In a system for controlling the raising and lowering of an aircraft spoiler control surface including a hydraulic cylinder and piston connected to said spoiler to cause said spoiler to be raised when said piston is in extended position and lowered when said piston is in retracted position, a source of hydraulic fluid under high supply pressure and a servo valve for directing said hydraulic fluid to one side or the other of said piston;

a blocking and relief valve connected between the retract side of said cylinder and said servo valve comprising a housing having an internal chamber, a first piston movable in said housing having a working area exposed to said high

pressure source, and means in said chamber defining large, intermediate and smaller diameter bores;

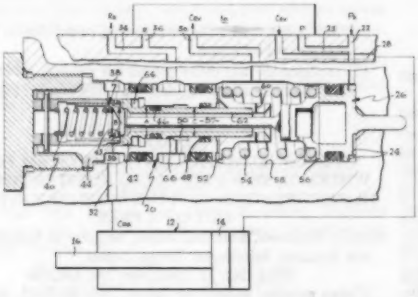
a seat member movable axially within said chamber including a second piston in said large diameter bore and intermediate and smaller diameter sections in said intermediate and smaller diameter bores, respectively, a valve seat on said second piston and an axially directed interior passage, said piston and said large diameter bore functioning as a damping means;

a hollow poppet valve member in said housing and resilient means urging said poppet valve member against said seat;

a lock member in said housing communicating with said seat member and said poppet member and port means communicating said lock chamber with the interior of said poppet member;

a controlled pressure chamber in said housing communicating with said axially directed interior passage;

a first spring retainer movable with said first piston, a second spring retainer operably connected with said seat member,



and a spring positioned in said controlled pressure chamber between said second spring retainer and said first spring retainer, said first spring retainer including means movable therewith capable of forcing said poppet member away from said valve seat;

such that when the pressure in said controlled pressure chamber is at a low value said supply pressure moves said first piston and said first spring retainer to open said poppet member; when the pressure in said lock chamber is at a low value said poppet member is caused to open as a result of higher pressure in said controlled pressure chamber; when said supply pressure is at a low value and the pressure in said lock chamber is at a normal working value, said poppet is held against said seat; and when said lock chamber pressure reaches a predetermined pressure above a normal supply pressure value, said predetermined pressure acting on an operating area of said seat member overcomes the force of said spring and forces said seat member away from said poppet.

4,433,616

PISTON ASSEMBLY FOR AN INTERNAL COMBUSTION ENGINE

Herbert J. Hauser, Jr., Waterloo, Iowa, assignor to Deere & Company, Moline, Ill.

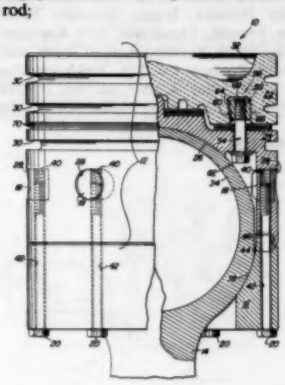
Filed Jul. 6, 1981, Ser. No. 280,395
Int. Cl.³ F16J 1/14
U.S. Cl. 92—190 **11 Claims**

1. A piston assembly for an internal combustion engine having a rotatable crankshaft, said piston assembly comprising:

(a) a piston body having a concave configured cavity formed in one end and having a plurality of recesses formed in its outer circumference which communicate with said concave configured cavity;

(b) a connecting rod attached at one end to said crankshaft and having a second spherical end matable in said concave configured cavity of said piston body;

(c) a hollow annular skirt having an arcuately shaped inner surface engageable with said spherical end of said connecting rod;



(d) a plurality of retainers positioned in said recesses of said piston body; and

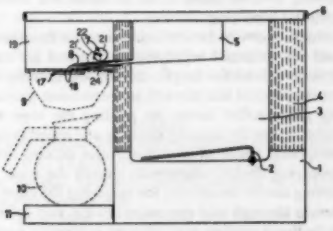
(e) attaching means for joining said skirt to said piston body, said attaching means including a plurality of fasteners passing through said skirt and into said retainers.

4,433,617

APPARATUS FOR PREPARING AND DISPENSING BEVERAGES

Jan Magnusson, Mariestad, Sweden, assignor to Jede-Automater Magnusson AB, Mariestad, Sweden

Filed Jan. 26, 1981, Ser. No. 228,467
Claims priority, application Fed. Rep. of Germany, Jan. 31, 1980, 8002412[U]
Int. Cl.³ A47J *31/00, 31/40*
U.S. Cl. 99—305 **5 Claims**



1. Apparatus for preparing and dispensing beverages having a preferably block-like housing and therein a tank for hot water and means for tapping water, characterized in that said tank is arranged as a main tank in which there is provided an affiliated tank for hot water, said means for tapping water comprising a tap connected into the main tank, and a special pipe connected into the bottom of said affiliated tank, said special pipe having a manual shut-off device to control tapping said affiliated tank, said housing having an upper protrusion at one side of said housing, said special pipe being within said upper protrusion to discharge water centrally and downwardly from said upper protrusion, and means below said protrusion to mount a filter funnel to receive the discharged water, and below said filter funnel mounting means, a lower protrusion at the same side of the housing respectively for mounting a receptacle.

4,433,618

APPARATUS FOR CONTINUOUSLY MANUFACTURING FIBROUS HIGH PROTEIN FOODS

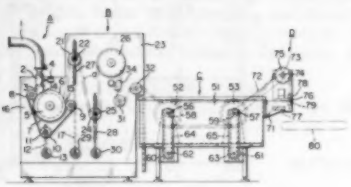
Tadashi Izutsu, Tokorozawa; Masanobu Koutake, Sakado; Yasunobu Hiraoka, Iruma; Shin-ichi Takafuji, Kodaira; Tamotsu Yamada, Yamanashi; Seiji Kurosawa, Yamanashi, and Tetsuo Satoh, Yamanashi, all of Japan, assignors to Snow Brand Milk Products Co., Ltd., Hokkaido, Japan

Filed Nov. 4, 1981, Ser. No. 318,246

Claims priority, application Japan, Nov. 13, 1980, 55-159785

Int. Cl.³ A23C *3/04, 9/00*

U.S. Cl. 99—455 **7 Claims**



1. An apparatus for continuously manufacturing a high protein food of fibrous form, comprising:

a raw material supplying device comprising a pipe adapted to be connected to a supply of milk curds, a nozzle connected for receiving curds from said pipe and having an outlet for discharging the curds in the form of a continuous rope, a first driven roller disposed adjacent to the outlet of said nozzle, said first roller having a circular groove in the periphery thereof, said groove being movable past the outlet of said nozzle and being adapted to receive the rope from said nozzle and transport it away from said nozzle, an endless belt having a first reach disposed adjacent to and opposed to the periphery of said first roller and adapted to move therewith whereby to maintain the rope within said groove, the end of said first reach of said belt adjacent to said nozzle defining with said first roller an inlet for receiving the rope from said nozzle and the opposite end of said upper reach of said belt defining with said first roller an outlet for discharging the rope having an controlled cross-sectional size from said raw material supplying device;

an extension device for receiving the rope from said outlet of said raw material supplying device and for drawing the rope to extend the length thereof and thereby reduce the cross-sectional size thereof, said extension device comprising guide roller means for guiding the rope and driven roller means for moving the rope at a speed faster than the peripheral speed of said first roller of said raw material supplying device whereby to stretch the rope;

a cooling device connected for receiving the rope after it has passed through said extension device, said cooling device including a cooling tank adapted to contain a coolant, and means for feeding the rope through said cooling tank whereby to cool the rope; and

a cutter device for receiving the rope from said cooling device and including a cutter for cutting the rope into fixed lengths.

4,433,619

METHOD FOR UNPLUGGING CYLINDRICAL BALER

Henry D. Anstey; Gerald F. Meiers, and Richard W. Koning, all of Ottumwa, Iowa, assignors to Deere & Company, Moline, Ill.

Continuation-in-part of Ser. No. 308,223, Oct. 5, 1981, Pat. No. 4,391,187. This application Aug. 6, 1982, Ser. No. 405,966

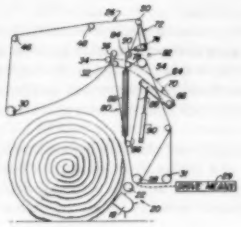
Int. Cl.³ B30B *5/06;* **A01D** *39/00*

U.S. Cl. 100—40 **6 Claims**

4. A method for unplugging an expandable bale forming chamber of a cylindrical baler of a slug of crop matrial fed into an inlet of the chamber comprising the steps of:

(a) disengaging a drive means for a plurality of belts defining said chamber,

(b) enlarging said chamber around a partially formed bale in said chamber,



(c) tensioning said belts and causing said belts to rotatably engage said bale; and

(d) reengaging said drive means for feeding said slug into said chamber and wrapping said slug around said bale.

4,433,620

HYDROPNEUMATIC CONTROL SYSTEM FOR A WHEELED, SELF-PROPELLED BOLSTER FOR THE TRANSPORTATION OF A DIE ASSEMBLY INTO AND OUT OF A PRESS

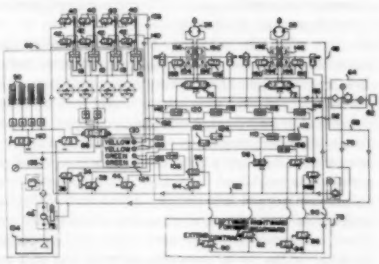
Hiroshi Kiyosawa, Komatsu, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Oct. 22, 1982, Ser. No. 436,069

Claims priority, application Japan, Oct. 30, 1981, 56-172783

Int. Cl.³ B30B *15/02, 15/06, 15/30*

U.S. Cl. 100—43 **9 Claims**



1. A hydropneumatic control system for a bolster capable of travelling along a first track into and out of a press and along a second track right-angularly crossing the first track, the bolster being of the type including a body having first and second sets of wheels for travelling along the first and second tracks respectively, either of the first and second sets of wheels being mounted to the bolster body via hydraulic lift jack means for up-and-down movement into and out of engagement with the tracks, and a positioning pin normally held in a raised position on the bolster body and moved down to a depressed position at the intersection of the first and second tracks in order to position the bolster thereon, the hydropneumatic control system comprising:

(a) a source of air under pressure;

(b) a first pneumatic motor coupled in driving relationship to at least some of the first set of wheels for moving the bolster back and forth along the first track;

(c) a second pneumatic motor coupled in driving relation-

ship to at least some of the second set of wheels for moving the bolster back and forth along the second track;

(d) first and second pilot-operated selector valves for controlling communication between the pressurized air source and the first pneumatic motor and between the pressurized air source and the second pneumatic motor, respectively;

(e) a source of hydraulic fluid under pressure;

(f) a third pilot-operated selector valve for controlling communication between the pressurized hydraulic fluid source and the hydraulic lift jack means;

(g) control valve means actuated manually for producing pneumatic signals for pilot-operating the first, second and third selector valves;

(h) sensor means actuated automatically for producing pneumatic signals indicative of whether the bolster lies in position in the press nor not, whether the hydraulic lift jack means are extended or contracted, and whether the positioning pin is in the raised or depressed position;

(i) signal processing means responsive to the pneumatic output signals of the control valve means and the sensor means for allowing the output signals of the control valve means to actuate the first, second and third selector valves only when the control valve means are operated properly; and

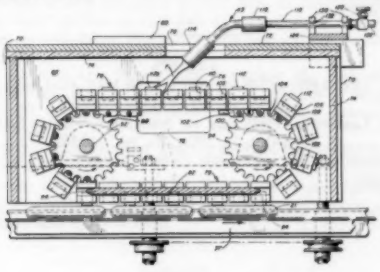
(j) indicator means for indicating the operating conditions of the bolster in response to at least the pneumatic output signals of the sensor means.

4,433,621

APPARATUS FOR BRANDING MEAT OR MEAT PRODUCTS

Richard Van Wyk, Darien, and James Eisenberg, Highland Park, both of Ill., assignors to Vienna Sausage Manufacturing Company, Chicago, Ill.

Filed Dec. 4, 1981, Ser. No. 327,284
Int. Cl.³ B41F *17/20*; A22C *17/10*
U.S. Cl. 101—11 **13 Claims**



1. An apparatus for affixing a brand on the surface of a plurality of meat products comprising:

(a) a first conveyor means having a surface portion for supporting and moving a plurality of relatively spaced meat products through a branding zone;

(b) a second conveyor means disposed in the branding zone and having a portion thereof in substantially opposed overlying relation to the surface portion of said first conveyor means, said second conveyor means including a plurality of relatively spaced branding elements mounted thereon, each of said branding elements being removably accommodated in a socket-like support means, thereby causing said branding elements to travel through the branding zone while in spaced substantially parallel relation to the product-supporting surface portion of said first conveyor means and causing said branding elements to continuously contact the product for the period of time the product travels through the branding zone;

(c) means for heating said branding elements to branding temperatures prior to same contacting the meat products in said branding zone;

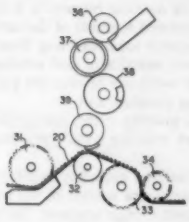
(d) means for coordinatingly driving said first and second conveyor means.

4,433,622

PRINTING STATION FOR AXIAL LEAD HANDLING SYSTEM

Gary W. Anderson, Transfer, and Dennis G. Stake, Greenville, both of Pa., assignors to GTI Corporation, San Diego, Calif.

Filed Sep. 30, 1982, Ser. No. 430,664
Int. Cl.³ B41F *17/22*
U.S. Cl. 101—40 **12 Claims**



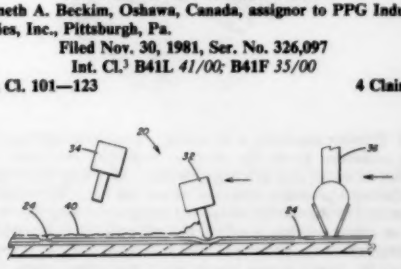
1. An apparatus for printing upon the body of axial lead components arranged upon a component tape, the tape having equally spaced openings for receiving sprocket teeth and equally spaced component receiving openings, there being tabs associated with said component openings extending from the tape defining slots being narrowed at the end away from the tape which slots may be spread by bending the tape comprising a horizontal base, a print station fixed above the base having at least an offset wheel rotating on a horizontal axis for rolling over the surface of the components to be printed to transfer indicia thereto, a bending roll mounted on an axle substantially parallel to the horizontal base, said roll having a circumferential groove therein so that the loaded component tape can be drawn over the bending roll without interference with the components, the diameter of the bending roll being sufficiently small to bend the tape enough to spread slots in the tabs thereof and to present only one component to the offset wheel of the print station at a time, an entry guide for slidably holding the loaded tape below the top of the bending roll, an exit guide for slidably holding the loaded tape below the top of the bending roll and having a sprocket wheel for engaging the sprocket openings in the tape and pulling the tape over the bending roll.

4,433,623

APPARATUS FOR AND METHOD OF APPLYING A PATTERN UPON A SUBSTRATE

Kenneth A. Beckim, Oshawa, Canada, assignor to PPG Industries, Inc., Pittsburgh, Pa.

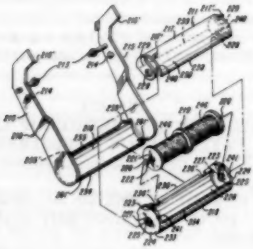
Filed Nov. 30, 1981, Ser. No. 326,097
Int. Cl.³ B41L *41/00*; B41F *35/00*
U.S. Cl. 101—123 **4 Claims**



1. A method of applying a pattern upon a substrate comprising the steps of:

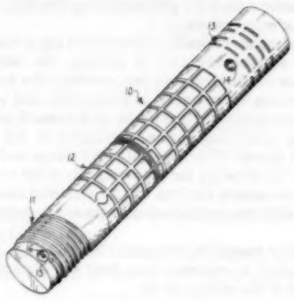
practicing a printing cycle including the steps of:
supporting a substrate in a printing position;
positioning a first major surface of a screen member in facing relation to the substrate in the printing position, the screen member having imperforated edge segments about an intermediate at least partially perforated segment, the intermediate perforated segment corresponding to the pattern;
providing a pattern-forming medium on the second and opposite major surface of the screen member;
moving portions of the pattern-forming medium from the second and opposite major surface of the screen member through the perforated segment toward the substrate to form a pattern thereon, wherein residual pattern-forming medium remains in at least localized areas of the perforated segment of the screen member;
spacing the screen member away from the printing position after the practice of said moving step;
removing the substrate having the pattern thereon from the printing position; and
repeating the printing cycle; and
after a selected printing cycle, practicing the following steps:
advancing a suction applying member across the second and opposite major surface of the screen member over an imperforated edge segment, the intermediate perforated segment and the other imperforated edge segment while the screen member is in the spaced position; and
controlling the magnitude of suction of the suction applying member so as to be minimal as the suction applying member advances over the imperforated edge segments to avoid damage thereto and to be greater by a magnitude sufficient to remove the residual pattern-forming medium through the perforated areas as the suction applying member advances over the intermediate perforated segment.

4,433,624
PRINTING APPARATUS
John D. Mistyurik, Tipp City, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio
Filed Feb. 17, 1982, Ser. No. 349,497
Int. Cl.³ B41F *1/08*
U.S. Cl. 101—314 **5 Claims**



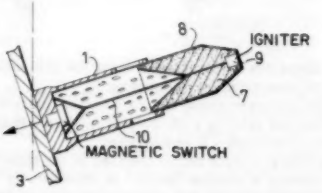
1. Printing apparatus, comprising: a print head having printing members, means for movably mounting the print head between initial and printing positions, an inking mechanism including a pivotally mounted carrier, an ink roller rotatably mounted by the carrier, and spring means for urging the carrier to an initial position in which the ink roller is in the path of movement of the print head, the print head being effective to move the carrier against the urging of the spring means as the print head moves from its initial position to the printing position to move the ink roller in one direction into inking relationship with the printing members, and means for returning the carrier to its initial position and to move the print head in the opposite direction in the event the spring means fails to return the carrier to its initial position during return of the print head to its initial position.

4,433,625
BLOW MOLDED DYNAMITE TUBE
Bobby L. Brown, Johnson County, Kans., assignor to Mar-Kay Plastics, Inc., Kansas City, Mo.
Filed Jan. 11, 1982, Ser. No. 338,638
Int. Cl.³ F42D *3/00*
U.S. Cl. 102—331 **4 Claims**



1. In a molded plastic dynamite tube having a cylindrical side wall, the upper portion thereof being an open end and the lower portion thereof being a closed end, the improvement comprising:
a dimpled recess in said tube adjacent the lower closed end thereof, and
a vent hole defined by said recess providing fluid communication between the inside of said tube and the outside of said tube.

4,433,626
UNDERWATER MISSILE FOR USE AGAINST SUBMERGED SUBMARINES
Sven Landström, Fjällgatan 16, Stockholm, Sweden S-116 45
Filed Oct. 13, 1981, Ser. No. 310,999
Claims priority, application United Kingdom, Oct. 13, 1980, 8032962
Int. Cl.³ F42B *21/00*
U.S. Cl. 102—390 **9 Claims**



1. An underwater missile for use against submerged submarines, the missile comprising a missile housing having at a foremost end portion thereof, which is intended to contact a submerged submarine, a magnetic contact surface provided by two magnets located adjacent to each other in reversed magnetic polarity relation creating a field of magnetic leakage, and a magnetically operated switching means located adjacent to the magnetic leakage field from the magnets and arranged to be operated when the leakage field is increased because of a metallic object located within the magnetic field of the mag-

nets, the operation of the switching means being arranged to trigger an explosive charge within the missile.

4,433,627

PLASTIC CONVEYOR TROLLEY WITH BEARINGS

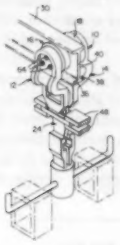
David J. Forshee, Oxford, Mich., assignor to Formall Syn-Trac Systems, Inc., Madison Heights, Mich.

Filed Jul. 29, 1981, Ser. No. 287,884

The portion of the term of this patent subsequent to Oct. 21, 1997, has been disclaimed.

Int. Cl.³ B61B *3/00*

U.S. Cl. 104—95 **8 Claims**



1. In an improved trolley assembly for operation in an I-beam monorail conveyor system, said trolley assembly being provided with a pair of detachably connected spaced apart unitary integrally formed molded plastic trolley arms, a unitary integrally formed molded plastic stub axle easily removably attached to each said trolley arm upon and adjacent the inward face of an upper portion of said arm, a unitary integrally formed molded plastic trolley wheel rotatably mounted on each said stub axle and retained by said stub axle on the inward side of said trolley arm, removable fastening means extending through said trolley arm upper portion from its outer side and into the body portion of said stub axle fixedly securing said stub axle to said upper portion inward face against rotation, wherein the improvement comprises

each said stub axle having a body portion, the perimetric surface of which is notched with a plurality of axially parallel radially spaced apart longitudinally extending recesses,

a cylindrical plastic roller bearing disposed and rotatable in each said recess,

each said wheel being rotatably supported on said bearings and retained by said stub axle on the inward side of said trolley arm upper portion.

4,433,628

APPARATUS FOR PREVENTING RUNAWAY OF CARRIERS IN POWER AND FREE CONVEYOR

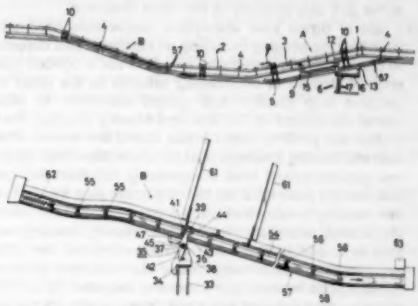
Takao Wakabayashi, Shinsenri-Minamimachi, Japan, assignor to 501 Nakanishi Metals Works Co., Ltd., Osaka, Japan

Filed Feb. 9, 1982, Ser. No. 347,241

Int. Cl.³ B61H *9/04*; B61B *10/02*; B66B *5/16*

U.S. Cl. 104—172 S **7 Claims**

1. An apparatus for preventing runaway of carriers in a power-and-free conveyor including a power rail having a drive chain, a free rail disposed below the power rail at a predetermined distance therefrom, the carriers movably supported by the free rail and having engagement portions, and a plurality of pusher dogs attached to the drive chain and engageable with the engagement portions of the carriers, the conveyor having a rising gradient section and a falling gradient section, the runaway preventing apparatus comprising a runaway preventing stopper provided on each of the carriers and rotatable about a longitudinal midportion of the stopper in an approximately vertical plane in parallel with the direction of advance of the conveyor, a restraining member engageable with one end of the stopper below the center of the rotation for usually preventing the other end of the stopper from turning forward to hold the stopper in an approximately vertical position, a plurality of runaway preventing contact members arranged in each of the rising and falling gradient sections in the path of movement of the other end of the stopper at a specified spacing in the direction of advance to come into contact with the other end, and biasing means biasing the stopper at all times



to forwardly turn the other end of the stopper and having a biasing force which is greater than the force acting to rearwardly turn the other end when the other end strikes against the runaway preventing contact member at a usual speed of advance of the carrier and which is smaller than the force acting to rearwardly turn the other end of the stopper upon the other end striking against the contact member when the carrier runs away in the falling gradient section.

4,433,629

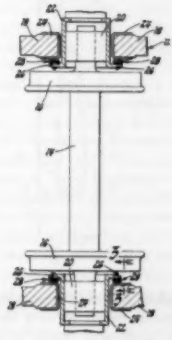
RAILWAY TRUCK BEARING MOUNTING ASSEMBLY

Roy W. Roush, Jr., Downers Grove, Ill., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 9, 1981, Ser. No. 328,941

Int. Cl.³ B61F *5/30*

U.S. Cl. 105—222 **2 Claims**



1. In a locomotive truck or the like of the type having a truck frame and an axle having the ends thereof supported rotatably on the truck frame by bearings, an assembly for mounting the bearings to the truck frame, comprising,

a pair of bearing housings, each containing a respective one of the bearings of the axle,

means freely slidably mounting each bearing housing to the truck frame to allow unrestricted lateral movement of the axle and bearing housings as a unit relative to the truck frame between predetermined limits,

each bearing housing including at least one stop member in

confronting relation to a respective stop member on the truck frame and laterally spaced therefrom by a predetermined amount within said predetermined limits, the stop member of one bearing housing moving laterally toward the respective stop member of the truck frame as the bearing housings and axle move as a unit laterally in one direction, the stop member of the other bearing housing moving laterally toward the respective stop member of the truck frame as the axle and other bearing housing move as a unit laterally in the other direction,

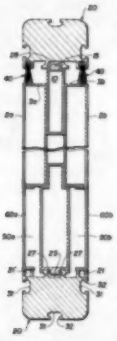
and lateral thrust load absorption means associated with each bearing housing including an elastomer pad mounted to one of the respective stop members and a contact plate secured thereto in confronting relation to the other respective stop member and spaced therefrom to allow lateral movement of the axle and bearing housing freely within said predetermined limits, lateral movement of the axle and bearing housings as a unit in one direction beyond one predetermined limit compressing the elastomer pad and contact plate between the respective stop members of one bearing housing and truck frame to absorb the lateral thrust load, lateral movement of the bearing housings and axle as a unit in the other direction beyond the other predetermined limit compressing the elastomer pad and contact plate between the respective stop members of the other bearing housing and truck frame to absorb the lateral thrust load, thereby preventing uncushioned contact between bearing housing and truck frame due to the lateral movement of the bearing housings and axle in either direction.

4,433,630

DESK AND PANEL STRUCTURES HAVING BRISTLE-COVERED ACCESS TO THE INTERIORS THEREOF

Robert Laborie, 7, rue Mariotte, 75Q17 Paris, France

Filed Jan. 15, 1982, Ser. No. 339,564
Int. Cl.³ H02G *3/28;* A47B *35/00*
U.S. Cl. 108—50 **12 Claims**



1. A panel providing access to concealed wiring comprising:

a. a rectangular panel frame formed by interconnecting an elongated upper horizontal frame member assembly, two elongated vertical frame member assemblies and a lower elongated horizontal frame member assembly;

b. an interior sidewall formed by the opposing inwardly facing sides of said elongated upper and lower horizontal frame member assemblies and of said vertical frame member assemblies;

c. two parallel and spaced-apart rectangular face sheets interconnected along the periphery thereof by panel face attaching members situated between said panel face sheets and extending out from the edges thereof;

d. first brush strip retaining channels on the inwardly facing sides of the upper, lower and vertical frame member assemblies; said first brush strip retaining channels extending lengthwise along said inwardly facing sides proximate one edge of the interior sidewall;

e. second brush strip retaining channels on the inwardly facing sides of the upper, lower and vertical frame member assemblies; said second brush strip retaining channels extending lengthwise along said inwardly facing sides proximate the other edge of the interior sidewall;

f. a panel face attaching member retaining channel securing the panel face attaching members extending beyond the edges of the panel face sheets to the opposing inwardly facing sides of the upper, lower and vertical frame member assemblies, said panel face attaching member retaining channel extending lengthwise on the inwardly facing sides of the upper, lower and vertical frame member assemblies, substantially parallel to and intermediate the first and second brush strip retaining channels; and

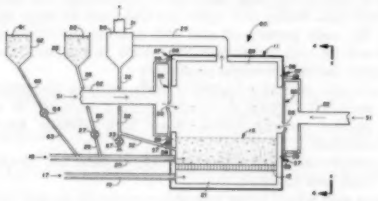
g. brush strips, comprised of a brush retaining back and brush material, secured within at least one of the first and second brush strip retaining channels of at least one frame member assembly, with the brush material extending out from the channel to the opposing edge of the rectangular face sheets to form a means for accessing wiring concealed by said brushes.

4,433,631

METHOD AND APPARATUS FOR PRODUCING A USEFUL STREAM OF HOT GAS FROM A FLUIDIZED BED COMBUSTOR WHILE CONTROLLING THE BED'S TEMPERATURE

Bruce C. Lindahl, Minneapolis, Minn., assignor to FluiDyne Engineering Corporation, Minneapolis, Minn.

Filed May 18, 1981, Ser. No. 264,438
Int. Cl.³ F23G *5/00*
U.S. Cl. 110—245 **7 Claims**



1. A method of producing a useful stream of hot gas from a fluidized bed combustor while controlling the temperature of the bed comprising:

(1) creating and maintaining a fluidized bed within a combustion chamber, said fluidized bed comprising a turbulent suspension of particulate matter from which particulate matter is thrown into the freeboard region above the bed at a temperature substantially equal to the temperature of the bed;

(2) introducing fuel into the fluidized bed and combusting substantially completely said fuel in said bed;

(3) capturing and feeding back into the bed particulate matter blown out of the combustion chamber; and

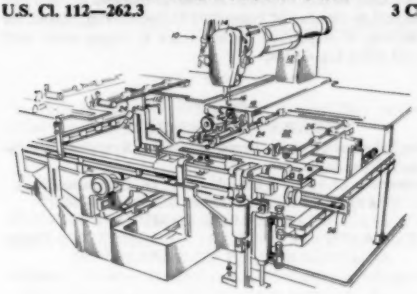
(4) introducing cooling gas, which has a temperature relatively lower than bed temperature and at which the cooling gas quenches combustion in the freeboard region, substantially horizontally into the freeboard region and into contact with particulate matter thrown into the freeboard region and lowering the temperature of the particulate matter while raising the temperature of the cooling gas before the particulate matter recycles by falling back into the bed or by being captured and fed into the bed after blowing out of the combustion chamber.

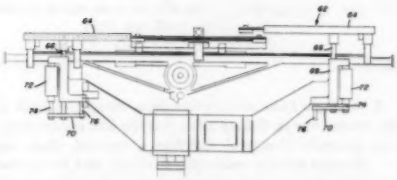
4,433,632

TRANSFERRING SUCCESSIVE WORKPIECES TO AND FROM A WORK STATION

Michael M. Becka, Nashua, and George Bennett, Milford, both of N.H., assignors to International Shoe Machine Corporation, Nashua, N.H.

Filed Oct. 28, 1981, Ser. No. 316,017
Int. Cl.³ D05B 97/00, 21/00, 1/00
U.S. Cl. 112—262.3 3 Claims





1. A machine for performing a prescribed pattern of work on successive workpieces comprising: a work station that includes an operating mechanism having an operating instrumentality actuable to perform the work; a plurality of workpiece assemblies, each formed of a workpiece mount having a workpiece detachably secured thereto; shifting means so constructed as to be actuable to shift a workpiece assembly in a prone plane in a prescribed path past the work station while the operating instrumentality is actuated to enable the operating instrumentality to perform a pattern of work on the workpiece of the workpiece assembly that corresponds to said prescribed path; and workpiece assembly handling means for presenting to and withdrawing from the work station successive workpiece assemblies to enable the pattern of work to be performed on the successive workpieces while they are at the work station, characterized in that the workpiece assembly handling means comprises: a first and a second workpiece assembly elevating mechanism located on each side of the work station, each work elevating mechanism having releasable retaining means for releasably retaining a workpiece assembly thereon; elevating means associated with each elevating mechanism for moving each elevating mechanism heightwise between a lower position and an upper position; and an attaching arrangement for releasably attaching each workpiece assembly to the shifting means while the workpiece assembly is retained on its associated elevating mechanism with the associated elevating mechanism in its lower position; whereby a first workpiece assembly and a second workpiece assembly are respectively retained on the first and the second elevating mechanisms while the elevating mechanisms are in their upper positions; the first elevating mechanism is then lowered to its lower position with the shifting means in position to be located proximate to the lowered position of the first workpiece assembly; the first workpiece assembly is then released from the first elevating mechanism and is attached to the shifting means; the shifting means is then caused to move the first workpiece assembly to the work station and then move the first workpiece assembly through said prescribed path while the operating instrumentality is actuated; the operating instrumentality is then deactuated and the shifting means is caused to return the first workpiece assembly proximate to the first elevating mechanism in its lowered position; the first workpiece assembly is then unattached from the shifting means and is again retained on the first elevating mechanism; the first elevating mechanism is then returned by its elevating means to its uper position where the first workpiece assembly is released therefrom and a third workpiece assembly may be retained thereon; and, after the first elevating mechanism has commenced its rise to its upper position, the second elevating mechanism, the second workpiece assembly, the shifting means, and the operating instrumentality are caused to repeat the steps and the relative movements referred to above with respect to the first elevating mechanism and the first workpiece assembly.

3. For use with a machine for performing a prescribed pattern of work on successive workpieces, the machine comprising: a work station that includes an operating instrumentality actuable to perform the work on a plurality of workpiece assemblies that are each formed of a workpiece mount having a workpiece detachably secured thereto; and shifting means so constructed as to be actuable to shift a workpiece assembly in a prone plane in a prescribed path past the work station while the operating instrumentality is actuated to perform a pattern of work on the workpiece that corresponds to said prescribed path; a method of presenting to and withdrawing from the work station successive workpiece assemblies to enable the pattern of work to be performed on successive workpieces while they are at the work station comprising: providing a first and a second workpiece assembly elevating mechanism located on each side of the work station, each elevating mechanism being movable between a lower position and an upper position; retaining a first workpiece assembly and a second workpiece assembly respectively on the first and the second elevating mechanisms while the elevating mechanisms are in their upper positions; lowering the first elevating mechanism to its lower position with the shifting means in position to be located proximate to the lowered position of the first workpiece assembly; then releasing the first workpiece assembly from the first elevating mechanism and attaching the first workpiece assembly to the shifting means; then causing the shifting means to move the first workpiece assembly to the work station and then move the first workpiece assembly through said prescribed path while the operating instrumentality is actuated; then deactuating the operating instrumentality and causing the shifting means to return the first workpiece assembly proximate to the first elevating mechanism in its lowered position; then unattaching the first workpiece assembly from the shifting means and again retaining the first workpiece assembly on the first elevating mechanism; then returning the first elevating mechanism to its upper position, releasing the first workpiece assembly from the first elevating mechanism and retaining a third workpiece assembly on the first elevating mechanism; and, after the first elevating mechanism has commenced to return to its upper position, causing the second elevating mechanism, the second workpiece assembly, the shifting means, and the operating instrumentality to repeat the steps and the relative movements referred to above with respect to the first elevating mechanism and the first workpiece assembly.

4,433,633

CONTROLLED GAS GENERATOR SYSTEM

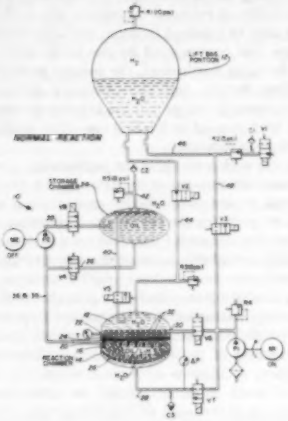
Don W. Caudy, Sunbury; Donald J. Hackman; John R. Myers, both of Columbus, all of Ohio, and Robert T. Hoffman, Kailua, Hi., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 16, 1982, Ser. No. 368,933
Int. Cl.³ B63C 7/10
U.S. Cl. 114—54 19 Claims

1. A gas generator comprising:
a reaction chamber having top and bottom ends;

a perforated member mounted transversely across the entire reaction chamber for containing a reactant material between the perforated member and one end of the reaction chamber;

the reaction chamber being adapted to contain liquids which have dissimilar specific gravities, one of the liquids being reactive with the reactant and another of the liquids being nonreactive with the reactant, the reactive and nonreactive liquids having a mutual interface;



means connected to the reaction chamber for selectively moving the interface of the liquids above or below the perforated member;

a resilient diaphragm mounted transversely across the reaction chamber; and

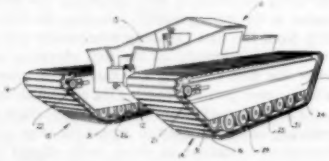
a line connected into the reaction chamber for introducing fluid on one side of the diaphragm so as to reduce the volume between the diaphragm and the perforated member.

4,433,634

TRACKED, AMPHIBIOUS VEHICLE WITH TRACK SECUREMENT AND GUIDE MEANS

John B. Coast, Baton Rouge, La., assignor to Coast Machinery, Inc., Baton Rouge, La.

Filed Feb. 5, 1982, Ser. No. 346,018
Int. Cl.³ B63C *35/34*
U.S. Cl. 114—270 **12 Claims**



11. A tracked, amphibious vehicle, comprising:

a. at least two spaced, elongated pontoons disposed at least generally parallel to one another;

b. a platform structure supported by the pontoons;

c. driving means for propelling the vehicle associated with said platform;

d. a series of longitudinally spaced bogie wheels supporting said vehicle mounted at the bottom area of each one of said pontoons on opposite sides of the longitudinal centerline of each one of said pontoons;

e. a movable, continuous, endless, chainless belt for each pontoon, each belt encircling its pontoon in tracking engagement with its bogie wheels;

f. a plurality of longitudinally spaced, ground engaging, transverse cleats extending across said endless belt and covering the bottom of the associated pontoon;

g. a series of longitudinally spaced, inwardly extending drive lug means attached to the assembly of the cleats and belt; and

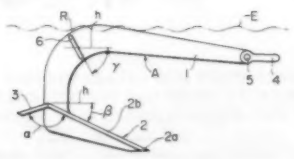
h. sprocket means, mounted at least at one end of each one of said pontoons and connected to said driving means, for driving its respective endless track in engagement with said drive lug means.

4,433,635

SINGLE FLUKE ANCHOR

Soroku Takahashi, Tokyo, Japan, assignor to Kyuroku Corporation, Tokyo, Japan

Continuation of Ser. No. 208,336, Nov. 19, 1980, abandoned.
This application Oct. 25, 1982, Ser. No. 436,648
Int. Cl.³ B63B *21/32*
U.S. Cl. 114—301 **6 Claims**



1. A single fluke anchor for ships, structures built on or in the water, buoys, fishing nets, and the like comprising:

a generally J-shaped defining a vertical plane with the straight portion extending frontally and horizontally and with the curved portion located below the straight portion;

a fluke formed integral to said shank at the free end of the curved portion and extending laterally therefrom, said fluke having a forward and downward inclination;

a generally flat stabilizer located behind said fluke and formed integral with said fluke, said stabilizer having a rearward and downward inclination and extending laterally beyond both sides of said fluke; and

a generally planar trigger integrally formed on each side of said shank at the end of the curved portion connected to the straight portion, each said trigger extending slightly laterally beyond the respective sides of said fluke and having a width narrower than the corresponding width of the curved portion from which each said trigger extends.

4,433,636

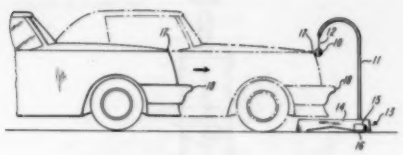
DUAL WARNING PARKING AID

Ronald A. Crouch, 779 S. Willow Glenn Dr., Tipp City, Ohio 45371

Filed Feb. 5, 1982, Ser. No. 346,396
Int. Cl.³ G01C *5/00*
U.S. Cl. 116—28 R **8 Claims**

1. A vehicle activated dual (warning sequential) visual indicator vehicle parking aid comprising a floor-mounted base means, a first readily deflectable parking limit visual warning member located in a position closer to the driver of said vehicle and further from the wall in the area where said vehicle is parked and suspended from an upper portion of a bendable second parking limit visual warning member by a flexible means joining said second warning member to said first warning member, wherein said second warning member is connected to said base means and is located in a position further from the vehicle driver and closer to said wall and is initially bendable to a fixed position; whereby said second warning

member is activated by contact with a bumper on said vehicle whereas said first warning member is activated by contact with



the front or rear-end thereof so as to give two (sequential) visual warnings independently of one another.

4,433,637

MICROENCAPSULATED CHOLESTERIC LIQUID CRYSTAL TEMPERATURE MEASURING DEVICE FOR DETERMINING THE TEMPERATURE OF NON-PLANAR OR PLANAR SURFACES

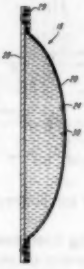
William L. Buirley, Dayton; Donald E. Koopman, Miami Township, Montgomery County; David B. McQuain, Dayton, and William H. Reeves, Englewood, all of Ohio, assignors to Vectra International Corporation, Miamisburg, Ohio

Continuation-in-part of Ser. No. 45,276, Jun. 4, 1979, Pat. No. 4,301,054. This application Jun. 10, 1981, Ser. No. 272,194

The portion of the term of this patent subsequent to Nov. 17, 1998, has been disclaimed.

Int. Cl.³ G01D *21/00*; G01K *11/12*

U.S. Cl. 116—207 **17 Claims**



1. A temperature measuring device for measuring the temperature of a surface comprising: a flexible sheet, a coating of microencapsulated cholesteric liquid crystal material covering at least a portion of the flexible sheet, a transparent sheet, means attaching the rigid transparent sheet to the flexible sheet to form a cavity therebetween, a transparent fill material filling the cavity between the flexible sheet and the transparent sheet, the transparent fill material being one in which adjacent portions thereof are relatively movable, the flexible sheet being engageable with a surface and conformable to the contour of the surface for transmission of thermal energy from the surface to the coating, each portion of the coating reflecting light energy in accordance with the temperature thereof and thus providing a thermal image of the surface, the thermal image being observable through the transparent sheet and through the transparent fill material, the composition of the coating comprising:

(a) a polymeric, film-forming binder material and

(b) microcapsules having transparent wall material, and having core material consisting essentially of about 55 to about 75% of cholesteryl pelargonate, about 14 to about 35% of oleyl cholesteryl carbonate, about 2.0 to about 6.0% of cholesteryl propionate and about 4.5 to about 7.2% of cholesteryl chloride.

4,433,638

AUTOMATIC FLOTATION RELEASE SYSTEM

Clifford E. Ashline, 5 Wilcox Blvd., Harahan, La. 70123

Filed Oct. 13, 1981, Ser. No. 311,153

Int. Cl.³ B63B *45/00*

U.S. Cl. 116—210 **20 Claims**

1. In an emergency locating unit adapted to be carried on a vehicle, said unit having an inflatable aerial device disposed in a storage condition, inflating means for launching said aerial device into the air and releasable trigger means for triggering operation of said inflating means, the improvement residing in a launching guide assembly, comprising removable closure means engageable with the trigger means for preventing operation thereof, flotation positioning means mounted on the inflating means for operative orientation thereof during said launching of the aerial device, breakaway housing means engageable with the closure means and the positioning means prior to said launching of the aerial device for holding the launching guide assembly operatively assembled and the aerial device protectively enclosed therein in the storage condition, said closure means comprising a pair of end covers axially spaced from each other by the flotation positioning means and the breakaway housing means.

4,433,639

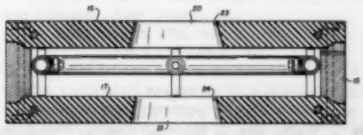
APPLICATION FOR SPRAYING LIQUID CHEMICAL ONTO DRILL PIPE

William H. Brown, 11137 - 29A Avenue, Edmonton, Alberta, Canada T6J 3Z4

Filed Jun. 1, 1982, Ser. No. 383,549

Int. Cl.³ B05C *5/00*, *15/00*

U.S. Cl. 118—316 **7 Claims**



1. An applicator, for spraying liquid chemical onto a pipe or rod string moving therethrough, said string having a varying outside diameter, comprising:

an annular housing mountable on the string and having a side wall and elastic, solid top and bottom walls which form a spray chamber, said latter walls forming aligned openings through which the string may pass, said openings each being undersize relative to the smallest outside diameter of the string to pass therethrough and having a sealing sur-

face adapted to grip the string outer surface to provide a substantially liquid-tight seal therewith, said housing, when in use, being free to move laterally with the string; and

a ring-like nozzle assembly, mounted within the spray chamber, for spraying the string.

4,433,640

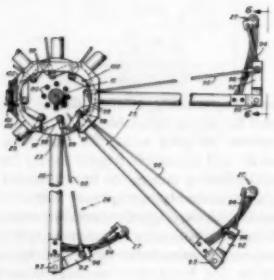
ROTARY SPRAYERS FOR APPLYING UNIFORM COATS TO CONVEYOR SUPPORTED WORK

Alfred E. Beck, Exeter, and Richard D. Cushing, Newton, both of N.H., assignors to Circle Machine Co., Inc., Seabrook, N.H.

Continuation-in-part of Ser. No. 211,282, Nov. 28, 1980, abandoned. This application Apr. 7, 1981, Ser. No. 251,868

Int. Cl.³ B05C *5/00*

U.S. Cl. 118—323 **11 Claims**



1. Apparatus for spraying work being carried on a conveyor, said apparatus of a type including a rotor spaced from the conveyor with the rotor axis normal relative to the center thereof, means to rotate said rotor at a constant rate, a series of spray heads, a connection between each spray head and said rotor, said connections spacing said heads from the rotor axis a distance such that the spray heads have arcuate paths across the conveyor upstream and downstream with respect to the rotor axis and means operable to effect the discharge of spray from each spray head as it travels across the conveyor along at least one of said paths, means operable to decrease the radial distance of each spray held from the axis of said rotor from a maximum adjacent one margin of the conveyor to a minimum centrally thereof and then increase said distance to a maximum adjacent the other margin of said conveyor.

4,433,641

BABY PIG FEEDER

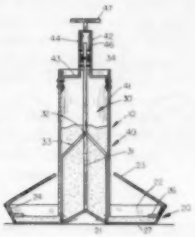
Dwaine C. Waite, Rte. 2, Harrison County, Woodbine, Iowa 51679

Filed Aug. 18, 1982, Ser. No. 409,210

Int. Cl.³ A01K *5/00*

U.S. Cl. 119—53 **6 Claims**

1. A pig feeder of a type having a feed pan and a hopper whose position in relation to said feed pan can be raised or lowered, the improvement comprising a vertical support post fixedly attached to the pan and having an opening through its upper end; means fixedly attached to the hopper for supporting a plurality of vertically spaced and aligned washers through which said support post passes; and a pin for insertion through



the support post opening, whereby the hopper may be selectively supported at any of various levels above the feed pan.

4,433,642

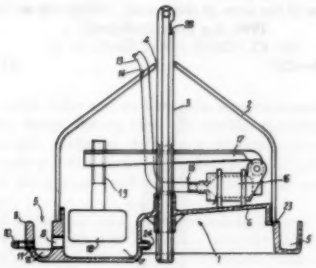
DRINKING TROUGH FOR POULTRY

Ernest Le Roy, 48, rue Monsieur Vincent, 35100 Rennes, France

Filed Apr. 1, 1982, Ser. No. 364,488

Int. Cl.³ A01K *7/02*

U.S. Cl. 119—78 **7 Claims**



1. A water distributor for poultry, comprising in combination:

trough means, including inlet means and outlet means;

means for supplying water to said trough inlet means, including means for maintaining the supplied water at a constant level and means for circulating the supplied water;

truncated conical cover means having an open upper end;

a rod attached to the base of the distributor and extending upwardly through said open upper end of said cover, said distributor being alternatively supportable on, or in elevated position above, the ground; and

said trough means further including scalloped plate means forming recessed areas and having in one of said areas a water distributor including a non-return valve connected to said outlet means, and a T-tap for the supply of water for drinking troughs for chicks.

4,433,643

METHOD AND APPARATUS FOR THE SUPPORT OF ANIMALS

Charles E. O. Fraser, 79 Marlborough, Southborough, Mass. 01772

Filed Jun. 9, 1982, Ser. No. 386,802

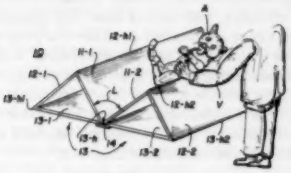
Int. Cl.³ A61D *3/00*

U.S. Cl. 119—103 **10 Claims**

1. Apparatus for the support of animals which comprises a base member;

a first side panel hingeably secured to one end of said base member;

a second side panel hingeably secured to the other end of said base member;



first and second cradle members hingeably secured to one another and being further hinged at one end to said first side panel and further hingeably secured at the other end to said second side panel.

4,433,644

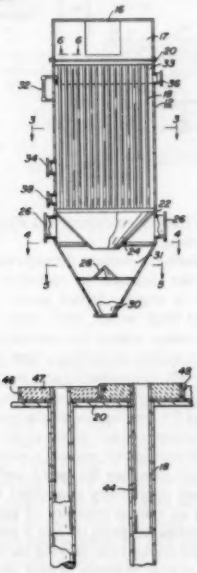
STEAM BOILERS

James J. Fitzpatrick, 317 Airdale Rd., Rosemont, Pa. 19011

Filed Nov. 6, 1981, Ser. No. 319,017

Int. Cl.³ F22B 9/02

U.S. Cl. 122—114 **14 Claims**



1. A boiler comprising a vessel, a plurality of tubes in said vessel connected at their ends to first and second tube sheets, said vessel having an inlet for high temperature gaseous effluent adjacent said first tube sheet and communicating with one end of said tubes, said vessel having an outlet communicating with the other end of said tubes, a metallic protective sleeve disposed within the inlet end portion of said tubes, a refractory juxtaposed to said first tube sheet and coupled to one end portion of said sleeves without interfering with flow through the sleeves, a retainer secured to each sleeve, said refractory including refractory members, each refractory member being coupled to one of said retainers for movement as a unit with its associated sleeve, each retainer and its sleeve being removably supported by said first tube sheet, and each retainer being an open top box, each refractory member being disposed in one of said boxes.

4,433,645

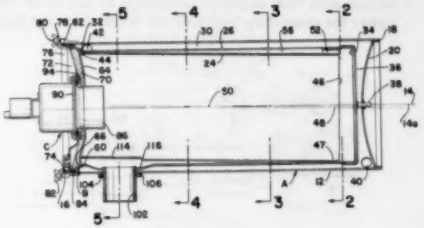
HEAT EXCHANGER

Harris W. Smith, Chagrin Falls, Ohio, assignor to Hunter Investment Company, Cleveland, Ohio

Filed May 20, 1981, Ser. No. 265,461

Int. Cl.³ F22B 23/06

U.S. Cl. 122—136 R **15 Claims**



1. A heat exchanger having a longitudinal axis along which a plane extends to provide a reference for portions of said heat exchanger located on opposite sides of said plane, elongated inner and outer tubular members having first and second opposite ends and extending generally along said axis in cooperative relationship to define a generally annular passage therebetween, said second end of said inner tubular member being open and said second end of said outer tubular member being closed, an exhaust outlet in said outer tubular member adjacent said first end thereof on one side of said plane, a burner mounted adjacent said first ends for discharging gases into said inner tubular member and from which such gases flow around said second end thereof into said annular passage and back toward said first ends to discharge through said exhaust outlet, said tubular members being cooperatively positioned such that said passage on said one side of said plane has a cross-sectional area which is a minimum adjacent said second ends and gradually increases toward said first ends while having on the opposite side of said plane a cross-sectional area which is a maximum adjacent said second ends and gradually decreases toward said first ends, whereby a major portion of the burner exhaust gases flow from said inner tubular member around said second end thereof and into said annular passage on said opposite side of said plane and then flow generally longitudinally along and circumferentially around said passage over to said one side of said plane for discharge through said outlet.

4,433,646

BOILER WATER TRIP SYSTEM

Allan J. Zadiraka, Akron, Ohio, assignor to The Babcock & Wilcox Company, New Orleans, La.

Filed Sep. 16, 1982, Ser. No. 419,112

Int. Cl.³ F22B 37/42

U.S. Cl. 122—504.2 **9 Claims**

1. A boiler water level trip system for a boiler having a drum with an upper and lower water level limit comprising:

tripping means connected to the boiler for tripping the boiler operation upon the occurrence of a trip signal;

a feedwater flow transmitter for sensing flow into the boiler;

a drum level transmitter for sensing a water level in the drum;

a steam pressure transmitter for sensing steam pressure coming from the boiler;

a function generator connected to the pressure transmitter for converting the steam pressure in a first stage of a turbine into a flow value out of the boiler;

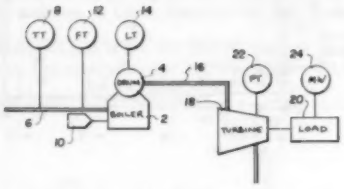
a comparator connected to said flow transmitter and to said

function generator for generating a flow error signal corresponding to a difference in flow into and out of the boiler;

an integrator connected to said comparator for integrating said flow error signal to generate a boiler level signal corresponding to a level of water in the boiler;

a first high/low indicator connected to said integrator for generating high and low indication signals upon the occurrence of a boiler level signal above and below selected limits respectively, said first high/low indicator having output terminals for each of said high and low level indication signals;

a second high/low indicator connected to said level transmitter for generating high and low level indication signals



upon the occurrence of upper and lower water levels in the drum, said second high/low indicator having output terminals for each of the high and low level indication signals;

a first AND gate having an input connected to each high level indication signal terminal of said first and second high level indicators and an output;

a second AND gate connected to the low level indication signal terminal of each of said first and second high/low indicators and having an output; and

an OR gate having inputs connected to each of said first and second AND gate outputs and an output connected to said tripping means, said OR gate generating said trip signal upon the occurrence of a signal from either of said first and second AND gates.

4,433,647

INTERNAL COMBUSTION MOTOR WITH TURBULENCE CHAMBER

Rudolf Muller, Chemin du Ciclet, 1860 Aigle, Switzerland

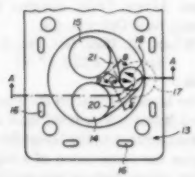
PCT No. PCT/CH80/00157, § 371 Date Aug. 6, 1981, § 102(e) Date Aug. 6, 1981, PCT Pub. No. WO81/02038, PCT Pub. Date Jul. 23, 1981

PCT Filed Dec. 18, 1980, Ser. No. 293,623

Claims priority, application Switzerland, Jan. 3, 1980, 1/80

Int. Cl.³ F02B *19/18, 31/00*

U.S. Cl. 123—263 **10 Claims**



1. An internal combustion engine comprising at least one combustion chamber, a corresponding piston, a cylinder head, a turbulence chamber having a revolution of symmetry about a symmetry axis provided in said cylinder head at an upper end of said combustion chamber and ignition means for compressed gases mounted in a wall of said turbulence chamber, said turbulence chamber being connected to said combustion chamber by at least one tangential channel provided in said cylinder head, said at least one tangential channel originating at a position remote from said turbulence chamber and opening at a tangent at a base portion of said turbulence chamber, said at least one tangential channel having a concave edge and a convex edge arranged so that the width of said at least one channel narrows down continuously in a direction toward said turbulence chamber, and said at least one channel having a depth which varies appreciably as an inverse progression with respect to the width of said at least one channel with the depth along said concave edge being greater than along said convex edge to thereby provide a better flow of combustible mixture penetrating in said turbulence chamber and enable an ordinate cyclonic turbulence of said combustible mixture around said symmetry axis of said turbulence chamber.

4,433,648

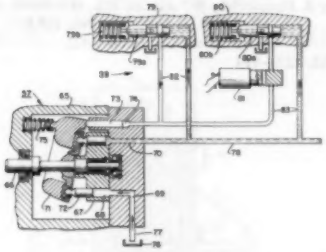
CONTROL MEANS FOR ENGINE COOLING SYSTEMS

James C. LeBlanc, 38261 Long St., Mt. Clemens, Mich. 48045

Filed Jun. 10, 1980, Ser. No. 158,284

Int. Cl.³ F01P *7/02*

U.S. Cl. 123—41.12 **25 Claims**



16. In a vehicle having an engine and a cooling system for said engine comprising:

means for circulating a coolant through said engine, a fluid motor drive fan disposed in operative relation with a radiator and an engine driven pump operatively connected to said fluid motor, said pump being a variable displacement pump, means for controlling the operation of said cooling system including a first pressure adjusting means operatively connected to said pump and responsive to an output pressure of said pump above a first predetermined pressure for varying the displacement and adjusting the output pressure of said pump to said fan at said first predetermined pressure to provide a normal cooling mode at a substantially constant fan speed, and second pressure adjusting means operatively connected to said pump and responsive to an output pressure of said pump above a second predetermined pressure and a predetermined temperature of said coolant for varying the displacement and adjusting the output pressure of said pump to said fan at said second predetermined pressure to provide a higher cooling mode at a higher fan speed than at said normal mode.

4,433,649

ENGINE

Hi B. Shin, 3635 W. 225th, Torrance, Calif. 90505

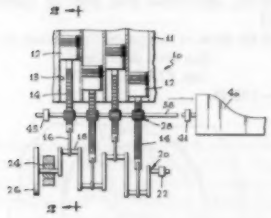
Filed Nov. 27, 1981, Ser. No. 325,117

Int. Cl.³ F02B *75/26;* **F16H** *21/22*

U.S. Cl. 123—54 R **2 Claims**

1. An engine of the class described comprising an engine block, at least one piston receiving cylinder formed in the engine block, a piston in each cylinder mounted for alternating rectilinear motion when the engine is operating, a downwardly extending piston rack secured to each piston, a power output

shaft, said shaft rotatably mounted in bearings and adapted to be connected to an engine drive chain, a gear associated with each piston, each gear having a concentric generally circular opening extending therethrough defining thereby an outer peripheral surface and an inner peripheral surface surrounding said circular opening, gear teeth on the outer periphery of each gear disposed in uniformly spaced angular relationship to each other, said gear teeth meshing with teeth on said piston rack, whereby the alternating rectilinear motion of said piston causes said gear to rotate alternately first in one direction and then in an opposite direction, a plurality of radially extending uniformly spaced angularly disposed ratchet teeth receiving openings, one for each gear tooth, formed on said inner peripheral surface, a ratchet pinion for each gear rigidly mounted on said power output shaft in said concentric opening of said gear, a plurality of ratchet teeth, one for each radially extending opening in said gear, pivotally mounted on said ratchet pinion, wherein each of said ratchet teeth extends along a plane which intersects adjacent respective teeth of said gear teeth located closet to each of said ratchet teeth, means individually biasing each ratchet tooth in a direction such that they pivot towards an associated radially extending opening, a stop associated with each ratchet tooth to prevent the ratchet tooth from pivoting beyond a predetermined amount in said direction whereby the alternating reciprocal movement of the pistons



when the engine is operating alternately rotates said gear first in one direction and then in an opposite direction, causing the ratchet teeth to pivot out of said radially extending openings when the gear rotates in its said opposite direction and prevents said ratchet teeth from pivoting out of said radially extending openings when the gear rotates in its said one direction so that alternating rotary motion of the gear causes the ratchet pinion to rotate in one direction whereby the power output shaft rotates in only one direction, said ratchet teeth having a size, shape and position on said ratchet pinion such that they remain out of power transmitting engagement with said inner peripheral surface of said gear whenever rotational speed of the power output shaft and pinion is greater than rotational speed of said gear in said one direction of said gear, so that if said engine is installed in a motor vehicle and the motor vehicle is driven at high speeds, the engine does not act as a drag on the motor vehicle when a driver releases pressure on a throttle of the engine to provide motor vehicle with an automatic free wheeling effect which only functions at higher speeds, a crankshaft rotatably mounted in bearings, a connecting rod pivotally secured at one end to a lower end of said piston rack and at another end to the crank of a crankshaft, and said crankshaft having a size, weight and shape such that a rotational energy imparted to the crankshaft returns each piston back into the cylinder in position in time for a next power stroke.

4,433,650

SYSTEM FOR CONTROLLING THE STARTING OPERATION OF AN INTERNAL COMBUSTION ENGINE

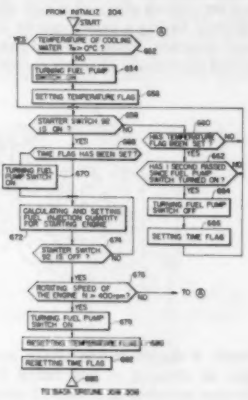
Matsuo Amano; Takao Teranishi, both of Hitachi; Yasunori Mouri; Osamu Abe, both of Katsuta, and Takao Sasayama, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 5, 1981, Ser. No. 240,968

Claims priority, application Japan, Mar. 5, 1980, 55-26676

Int. Cl.³ F02D *37/00*

U.S. Cl. 123—179 G **7 Claims**



1. A system for controlling the starting of an engine, comprising:

manipulation means including at least first and second contacts,

ignition means adapted to be connected to a power supply by said first contact,

a starter motor which is adapted to be connected to said power supply by said second contact,

a fuel injection system which includes an injector to be turned ON and OFF by electrical control, and a fuel pump for supplying pressurized fuel to said injector,

a temperature sensor which detects the temperature of a coolant of the engine, and

a control circuit to which said first and second contacts and said temperature sensor are connected, which drives said fuel pump from a point of time of turning-ON of said first contact and at least during a period of turning-OFF of said second contact and does not drive said fuel pump during any period of turning-ON of said second contact in case where, in a starting operation of said engine, the temperature of the coolant indicated by an output signal of said temperature sensor is not higher than a predetermined reference temperature, and which drives said fuel pump at least during any period of turning-ON of said second contact in case where the temperature of said coolant is higher than said reference temperature.

4,433,651

HELICAL INTAKE PORT TYPE SUCTION UNIT FOR HORIZONTAL SINGLE-CYLINDER DIRECT INJECTION TYPE DIESEL ENGINE

Kiyomi Nakakita, and Keiichiro Yamada, both of Sakaishi, Japan, assignors to Kubota Ltd., Osaka, Japan

Filed Mar. 19, 1982, Ser. No. 359,843

Claims priority, application Japan, Mar. 24, 1981, 56-41772[U]

Int. Cl.³ F02F *1/42*

U.S. Cl. 123—188 M **4 Claims**

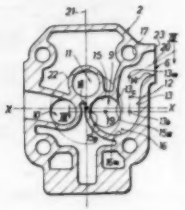
1. A helical intake port type suction unit for a horizontal

direct injection type diesel engine having a single cylindrical combustion chamber with a center, said unit comprising:

a cylinder head having a vertical center axis and comprising a substantially vertical inner wall facing said combustion chamber, an outer wall facing opposite to said inner wall, and at least one substantially vertical side wall;

an intake valve opening and an exhaust valve opening disposed side by side in said inner wall, said intake valve opening having a peripheral rim, and a center spaced vertically, in a first vertical direction, from said combustion chamber center;

a suction air opening disposed in said side wall, said suction air opening having a center spaced vertically, in second vertical direction opposite to said first vertical direction, from said combustion chamber center;



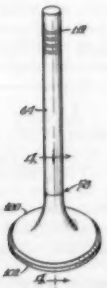
a generally S shaped helical intake port connecting said suction air opening to said intake valve opening, said intake port including an elongated substantially linear mid section, said mid section extending generally vertically in said cylinder head, said mid section being positioned laterally of said center axis and being defined by an inner wall and an outer wall, said inner wall being closer to said center axis than said outer wall, said inner wall having an end tangentially connected to said rim, and said outer wall being connected to a curving wall which forms a fore helical section of said intake port, said curving wall being formed progressively closer to said rim and connecting tangentially to said rim, the tangential connection of said curving wall being closer to said center axis than the tangential connection of said inner wall.

4,433,652

COMPOSITE VALVE AND PROCESS

Matthew W. Holtzberg, Ringwood, N.J., and Lawrence D. Spaulding, Naperville, Ill., assignors to Standard Oil Company, Chicago, Ill.

Filed Jun. 11, 1982, Ser. No. 387,322
Int. Cl.³ F01L *3/02*
U.S. Cl. 123—188 AA **44 Claims**



1. A composite engine valve, comprising:

a metal valve head for opening and closing an engine manifold communicating with a cylinder of an engine; and

an elongated, thermoplastic, amide-imide resinous polymeric valve stem connected to said valve head

said thermoplastic amide-imide valve stem and said metal valve head maintaining their structural integrity at engine operating conditions.

27. A process for forming a composite valve for use in an engine, comprising the steps of:

molding a thermoplastic, amide-imide resinous polymer to form an elongated valve stem;

allowing said amide-imide valve stem to cool below its plastic deformation temperature;

post curing said amide-imide valve stem by solid state polymerization to enhance the strength and integrity of said amide-imide valve stem;

forming a metal valve head; and

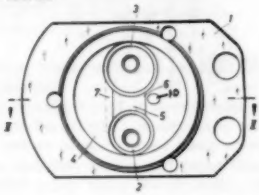
connecting said amide-imide valve stem to said metal valve head.

4,433,653

LIGHT METAL CYLINDER HEAD FOR A VALVE-CONTROLLED INTERNAL COMBUSTION ENGINE

Emil Lichtner, Odenthal-Voiswinkel; Gerd Ungeringer, Bergisch Gladbach, and Gerhard Giebel, Cologne, all of Fed. Rep. of Germany, assignors to Klöckner-Humboldt-Deutz Aktiengesellschaft, Cologne, Fed. Rep. of Germany

Continuation of Ser. No. 119,108, Feb. 6, 1980, Pat. No. 4,337,735. This application Jun. 24, 1982, Ser. No. 391,510
Claims priority, application Fed. Rep. of Germany, Feb. 9, 1979, 2904940
The portion of the term of this patent subsequent to Jul. 6, 1999, has been disclaimed.
Int. Cl.³ F02F *1/26*
U.S. Cl. 123—193 H **3 Claims**



1. A light metal cylinder head for an internal combustion engine controlled by valves, said cylinder head having a bottom which is adapted to be directed toward a combustion chamber belonging therewith, said bottom being provided with valve openings to allow communication with valves belonging therewith, and said cylinder head also having a bore communicating with said bottom substantially between said valve openings for receiving at least one of an injection nozzle and ignition aid, said cylinder head further having improvement in combination therewith comprising:

means defining at least one expansion gap generally and including therewith in particular at least one corrosion-resisant titanium metal insert in that porition of said bottom extending specifically between said valve openings and to a limited extent capable of taking up changing stresses in said cylinder head; and

an oxide layer coating additionally provided by anodic oxidation only on that portion of said bottom located between said valve openings and the region of said bore, said oxide layer coating having complementary dual effect thereof both for preventing cracks as well as fissure tendency due to thermal stresses and simultaneously for equalizing localized temperature differences in the cylinder head entirely to protect against formation of cracks since further increase of the combustion chamber temper-

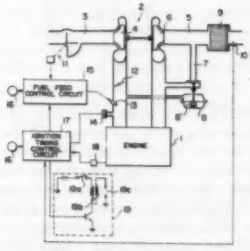
ature is substantially reduced and taking-up of material stresses is made possible through more nominal heat expansion of said oxide layer coating compared with that of the light metal cylinder head itself, said metal insert comprising a material which is also resistant with respect to how said oxide layer coating is produced, said oxide layer coating providing insulation exclusively for a hot location in said bottom to decrease peak temperatures at said location on the one hand and on the other hand permitting only minimal increase of temperature thereof.

4,433,654

KNOCK CONTROL DEVICE FOR INTERNAL COMBUSTION ENGINE

Katsuhiko Yokooku, Hiroshima, Japan, assignor to Toyo Kogyo Co., Ltd., Tokyo, Japan

Filed Aug. 12, 1982, Ser. No. 407,552
Claims priority, application Japan, Aug. 25, 1981, 56-132930
Int. Cl.³ F02D *37/02*
U.S. Cl. 123—425 **6 Claims**



1. A knock control device for an internal combustion engine having a combustion chamber with a spark plug, an intake system for introducing intake gas into the combustion chamber and an exhaust system for discharging exhaust gas therefrom comprising a knock detecting means for detecting occurrence of knock in the internal combustion engine, a temperature sensor for detecting the temperature of the exhaust system, and an ignition timing control means which receives the outputs of the knock detecting means and the temperature sensor, and is arranged to further retard the ignition timing by a first angle when knock occurs when the temperature of the exhaust system is lower than a predetermined value, and to further retard the ignition timing by a second angle smaller than the first angle when knock occurs when the temperature of the exhaust system is not lower than the predetermined value.

4,433,655

INTERNAL COMBUSTION ENGINE

Tony R. Villella, 2030 N. Black Canyon Hwy., Phoenix, Ariz. 85009

Division of Ser. No. 949,372, Oct. 6, 1980, Pat. No. 4,291,651.
This application Jun. 29, 1981, Ser. No. 278,581
Int. Cl.³ F01M *1/00*
U.S. Cl. 123—196 R **19 Claims**

1. In an internal combustion engine which includes

a first area of relative movement between a crankshaft and a crankcase in which it is journalled,

a second area of relative movement between said crankshaft and the first end of a connecting rod journalled thereon, and

a third area of relative movement between the second and of said connecting rod and a pivotally connected piston, reciprocal within a cylinder,

improvements therein consisting of a lubrication system for supplying a lubricant to any of said areas, said system comprising:

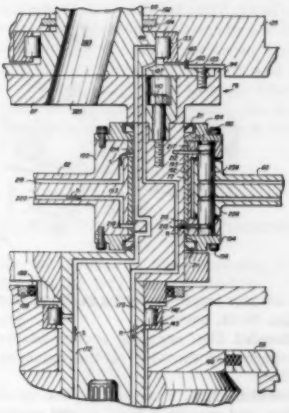
(a) a primary delivery channel extending longitudinally within said crankshaft;

(b) a reservoir remote from said crankcase for holding a supply of said lubricant;

(c) pump means for drawing said lubricant from said reservoir and for supplying pressurized lubricant to said primary delivery channel;

(d) a primary return channel extending longitudinally within said crankshaft and communicating with said reservoir;

(e) passage means communicating between said primary delivery channel and said primary return channel for supplying said pressurized lubricant to said first area of relative movement and returning said lubricant to said primary return channel, said passage means including



a supply passage communicating between said area and said primary delivery channel; and

a return passage communicating between said area and said primary return channel;

(f) seal means for retaining said lubricant in said first area of relative movement; and

(g) said second area of relative movement further including a rod bearing journalling said first end of said connecting rod to said crankshaft and wherein said seal means includes a first seal element proximate one end of said rod bearing and a second seal element proximate the other end of said rod bearing, each said seal element sealingly engageable between said crankshaft and said connecting rod.

4,433,656

AUTOMOTIVE OIL FILTER PRECHARGING ARRANGEMENT

Joseph E. Norwood, Sr., 312 Keyser Ave., Petersburg, W. Va. 26847

Filed Jul. 22, 1982, Ser. No. 400,753
Int. Cl.³ F01M *1/00*
U.S. Cl. 123—196 A **4 Claims**

1. An adaptor for mounting and precharging with oil a spin-on type of oil filter on an internal combustion engine having a lubrication system including oil passages in the engine block, and mounting means on the block for an oil filter, the filter when so mounted being in the flow of the oil and having a threaded central mounting hole in the base thereof, a plurality of other holes in said base annularly disposed about said central mounting hole, and a circular gasket surrounding said plurality of other holes, said mounting means including a threaded nipple adapted to matingly engage said threaded central mounting hole and a sealing surface adapted to sealingly engage said gasket, said adaptor comprising:

(1) a mounting plate adapted to be mounted on said filter mounting means, having:

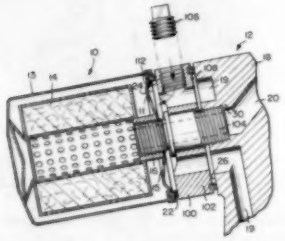
an engine mating surface adapted to mate with said sealing surface of said mounting means, said engine mating surface having a gasket thereon which forms a tight seal between said mating surface and said sealing surface;

an oil filter mounting surface located on the side of said plate opposite to said engine mating surface;

a central aperture extending through said plate from said engine mating surface to said oil filter mounting surface;

a plurality of plate holes annularly arranged around said plate central aperture and passing through said plate to provide fluid communication between the filter mounting and engine mating surfaces of said plate; and

a port in the periphery of said mounting plate in fluid communication with one of said plurality of plate holes;



(2) an adaptor nipple, replacing said threaded nipple in said engine block, having:

a threaded filter engaging portion adapted to matingly engage said threaded central mounting hole in said filter;

a threaded engine mounting portion smaller in diameter than said mounting plate central aperture, which extends through said central aperture and is adapted to matingly engage said engine block; and

a retaining flange extending outwardly from said adaptor nipple between said threaded filter engaging portion and said threaded engine mounting portion, for engaging said adaptor plate and retaining it on said engine block; and

(3) closure means for sealing said port after said filter has been charged with oil.

4,433,657

MODIFICATION OF AN INTERNAL COMBUSTION ENGINE SO AS TO OPERATE PERMANENTLY WITH A REDUCED NUMBER OF CYLINDERS

George Levinson, 105-75 Flatlands First St., Brooklyn, N.Y. 11236

Filed Aug. 17, 1981, Ser. No. 293,423
Int. Cl.³ F02D *13/06*
U.S. Cl. 123—198 F 6 Claims

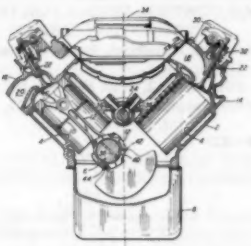
1. A method of converting an internal combustion engine of the type defined from operation with n cylinders to operation with m cylinders, where m is a positive integer less than n, comprising the following steps (a), (b), and (c), steps (a), and (b) not necessarily being performed in the order stated:

(a) removing the cylinder head from the cylinder block and forming in the crown of an operative piston associated with at least one cylinder a hole which is of substantial cross-sectional area relative to the cross-sectional area of the cylinder, and replacing the cylinder head;

(b) removing the intake manifold, removing the valve push rods and hydraulic valve lifters associated with said one cylinder, sealing the exit ports for oil opening into the bores for the valve lifters associated with said one cylinder, and replacing the intake manifold; and

(c) checking the balance of the engine and, if necessary, adjusting the engine to place it in balanced condition.

5. An internal combustion engine comprising a cylinder block formed with n cylinders, and a crankshaft for having n connecting rods journalled thereon to connect the crankshaft to respective pistons fitted reciprocatably in the n cylinders respectively, said crankshaft being formed with a passageway which opens to the exterior of the crankshaft in n exit ports for feeding lubricating oil to the bearing surfaces for the connecting rods respectively, said cylinder block also being formed with n pairs of bores associated with the cylinders respectively for receiving actuating trains for inlet and exhaust valves, and



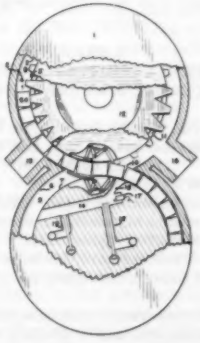
with passageways which open to the interior of said bores in exit ports for feeding oil to the bores, and the engine further comprising n initially operative pistons fitted reciprocatably in the n cylinders respectively, at least one but less than all of said initially operative pistons being formed in its crown with a hole which is of substantial cross-sectional area relative to the cross-sectional area of the cylinder, n connecting rods journalled on the crankshaft and connecting the crankshaft to the n pistons respectively, valve acuating trains fitted in the bores associated with the cylinders in which the pistons without holes are fitted, and means for blocking flow of oil from the exit ports, opening to the interiors of the bores associated with the or each cylinder having fitted therein a piston with a hole.

4,433,658

BI-ANNULUS ROTARY ENGINE

John S. Stojanowski, 198 Heberton Ave., Staten Island, N.Y. 10302

Continuation-in-part of Ser. No. 246,101, Mar. 20, 1981, abandoned. This application Mar. 16, 1983, Ser. No. 460,593
Int. Cl.³ F02B *53/00*
U.S. Cl. 123—221 6 Claims



1. A rotary engine of the internal combustion type, comprising:

a rotor housing consisting of two hollow annular chambers

of the same size lying in the same plane; the circles drawn at the mid-point of each annulus being tangent to each other and non-intersecting;

said annuluses overlap to form a common chamber;

a rotor consisting of loosely coupled segments is centrally disposed within said annular chambers;

said rotor consisting of a fixed number of segments which, when positioned totally within one annulus, fully circumscribes the smaller circumference of said annulus;

said rotor being in slidable and sealable engagement with said rotor housing;

said rotor being free to rotate in a fixed direction, alternately through each annulus thereby describing a 'figure 8' path;

power transfer means are secured to said rotor via engagement of rotatable, concentrically disposed means within one annulus and extending beyond said rotor housing; said annulus being referred to as the power transfer annulus;

compression/combustion means are recessed in the inner surface of the second annulus; said annulus being referred to as the non-power transfer annulus;

said compression/combustion means is in spaced relationship with said common chamber;

intake passage means are contained within said compression/combustion means and in cyclic cooperation and communication with said non-power transfer annulus;

exhaust passage means are contained within said compression/combustion means and in cyclic cooperation and communication with said non-power transfer annulus;

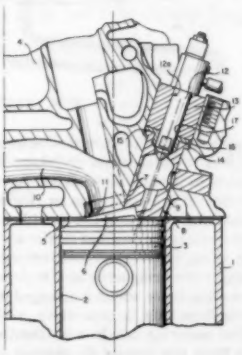
said intake and exhaust passage means being in cyclic cooperation and communication to provide mutually exclusive fluid flow systems.

4,433,659

PRECOMBUSTION CHAMBER FOR INTERNAL COMBUSTION ENGINES WITH COMPRESSION-IGNITION

Antonio Burgio, Moncalieri, Italy, assignor to Fiat Auto S.p.A., Turin, Italy

Filed Jul. 17, 1979, Ser. No. 58,397
Claims priority, application Italy, Jul. 26, 1978, 53584/78[U]
Int. Cl.³ F02B *19/10*
U.S. Cl. 123—256 **3 Claims**



1. In an internal combustion engine with compression-ignition of the type having:

at least one cylinder with a piston slidable therein;

a cylinder head having a wall facing said cylinder;

a combustion chamber within said cylinder delimited at one end by the said wall of the cylinder head and at the other end by the piston;

a fuel injector associated with said cylinder;

a seat in said wall of the cylinder head;

a substantially cylindrical tubular metal body mounted in said seat and having an internal cavity which forms a precombustion chamber communicating with the said combustion chamber, said internal cavity having a central cylindrical part, the end of which adjacent the combustion chamber is connected by means of a frusto-conical part with the cylindrical second part of reduced diameter having an axis parallel to the axis of said central part, a first end part, the axis of which is inclined to the axis of said cylindrical second part of reduced diameter, affording communication between the said second part and the combustion chamber, and a second end part coaxial with the said central cylindrical part at the end of said cavity opposite the combustion chamber, said second end part defining a seat for said fuel injector for the injection of fuel into said precombustion chamber,

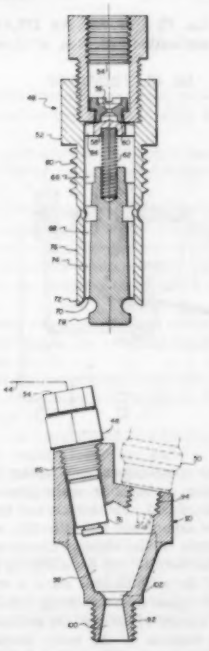
the improvements comprising the axis of the said cylindrical second part of reduced diameter being displaced with respect to the axis of the said central cylindrical part in the opposite direction to the inclination of said first end part, and said central cylindrical part being delimited by a wall having a radial hole defining a seat for a preheating glow plug compatible with said precombustion chamber with the axis of said radial hole being inclined at an angle substantially equal to 5° relative to a radial plane perpendicular to the axis of said central cylindrical part in the direction of the second end part.

4,433,660

FUELING SYSTEM FOR INTERNAL COMBUSTION ENGINE

Richard F. Blaser, 210 Caroline St., Cape Canaveral, Fla. 32920

Filed Oct. 22, 1981, Ser. No. 314,016
Int. Cl.³ F02B *3/06*
U.S. Cl. 123—266 **16 Claims**



1. A fueling system for directly supplying flash evaporated fuels to the combustion chamber of an internal combustion

engine operable in an Otto or diesel cycle during an intake event comprising:

a housing arranged to be secured to the engine;

a liquid fuel holding chamber in the housing and at least one restricted passageway providing communication between the holding chamber and the combustion chamber;

a liquid fuel supply duct including fuel metering means in communication with the liquid fuel holding chamber;

a one-way flow controller (e.g., check valve) for permitting flow of liquid fuel from the supply duct to the holding chamber only when the pressure in the duct exceeds the pressure in the chamber by a predetermined differential pressure and for preventing flow otherwise;

said liquid fuel holding chamber and restricted passageway having a total volume sufficient to contain a liquid fuel supply sufficient for two or more combustion cycles of the engine combustion chamber;

said housing having means for securing same to the engine adjacent the combustion chamber so that said liquid fuel holding chamber and the entire restricted passageway are in direct heat exchange relationship with the combustion chamber during operation of the engine, whereby liquid fuel in the chamber and passageway is compressed and superheated during each combustion event and is directly flash vaporized into the combustion chamber during the intake portion of the combustion cycle after the housing has been preheated during the first few combustion cycles.

4,433,661

DEVICE FOR THE SPEED-DEPENDENT CLOSURE LIMITATION OF A CARBURETTOR MAIN THROTTLE

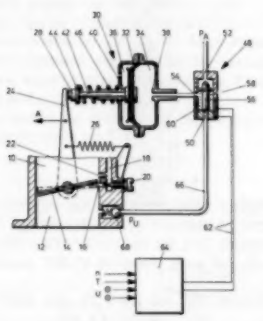
Günter Härtel, Neuss; Armin Schürfeld, Meerbusch, and Wolfgang Jordan, Grevenbroich, all of Fed. Rep. of Germany, assignors to Bosch & Pierburg System oHG, Fed. Rep. of Germany

Filed Jun. 19, 1981, Ser. No. 275,430

Claims priority, application Fed. Rep. of Germany, Jun. 20, 1980, 3022999

Int. Cl.³ F02M *7/04*

U.S. Cl. 123—339 **22 Claims**



1. Device for the speed-dependent closing limitation of a selectively adjustable carburettor main throttle, a mixing chamber on one side of said main throttle and an engine intake pipe on the opposite side of said main throttle, means for biasing said main throttle in the closing direction, including a variably positionable throttle stop for effecting a substantially complete closure of the main throttle above a rotational speed switching threshold higher than the idling speed, and thus the interruption of the supply of fuel and air and causes an idling minimum opening position of the main throttle below the rotational speed switching threshold, an electromagnetic switching element operated when the speed falls below the rotational speed switching threshold, said electromagnetic switching element comprising an electromagnetic 3/2-way valve **(48)** having a valve outlet **(54)**, a first valve inlet **(50)**, a second valve inlet **(52)**, and means for selectively closing one of said first and second valve inlet while the other one is open, said first valve inlet in communication with said engine intake pipe, a non-return valve **(68)** between said first valve inlet and said engine intake pipe said second valve in communication with one of the ambient atmosphere and another pressure source, a diaphragm box **(30)** divided by a movable diaphragm **(32)** into a control pressure chamber **(34)** and a vented diaphragm chamber, said valve outlet is in flow communication with said first valve inlet **(50)** above the rotational speed switching threshold and also when the ignition is switched off, said valve outlet is in flow communication, with said second valve inlet **(52)** below the rotational speed switching threshold, said control pressure chamber **(34)** is in flow communication with the valve outlet **(54)** and said movable diaphragm **(32)**, a throttle stop **(28)** mechanically connected to said movable diaphragm, and a stop spring **(46)** biases said throttle stop **(28)** toward the idling speed minimum opening position of said main throttle **(14)**.

4,433,662

FUEL SUPPLY SYSTEM

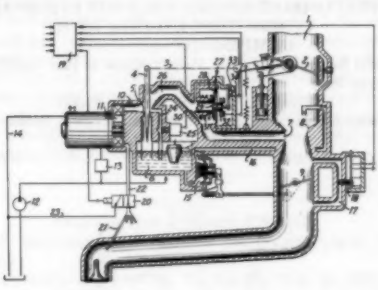
Hans-Jürgen Müller, Gelsenkirchen; Karl Schmidt, Neuss; Asoke Chattopadhayay; Rolf P. Heidemanns, both of Neuss; Georg Habel, Brüggen, and Ortwin Wittman, Kaarst, all of Fed. Rep. of Germany, assignors to Pierburg GmbH & Co., KG, Neuss, Fed. Rep. of Germany

Filed Aug. 4, 1982, Ser. No. 405,232

Claims priority, application Fed. Rep. of Germany, Aug. 5, 1981, 3130911

Int. Cl.³ F02M *7/12*

U.S. Cl. 123—438 **11 Claims**



1. A fuel supply system for mixture-compressing internal combustion engines, with a carrier air channel which is arranged in addition to a main air channel, having a throttle valve, and branches off from said main air channel between an air quantity measuring valve and the throttle valve, the fuel metering nozzle discharging into said carrier air channel, with a proportioning valve, provided at said fuel metering nozzle, said proportioning valve being adjustable in dependence on an air quantity measuring valve which is arranged in said main air channel upstream from said throttle valve, with a pump assigned to said fuel metering nozzle, with distributor channels which originate from said carrier air channel upstream from said pump, said distributor channels leading to the associated suction nozzles before the inlet valve, with a differential pressure valve which controls the carrier air stream, is arranged before said fuel metering nozzle and is adjustable in dependence on operating parameters, the effective surface of said differential pressure valve being acted upon on the one side by a variable force and the air pressure in said carrier air channel at the fuel outlet area and on the other side by the air pressure in said carrier air channel before the flow opening of said differential pressure valve, characterized in that said carrier air channel (7) discharges into a Venturi (8) which is arranged

upstream from said throttle valve (9) in said main air channel (1).

4,433,663

ELECTRONICALLY CONTROLLED FUEL INJECTION DEVICE

Yoshiaki Asayama, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

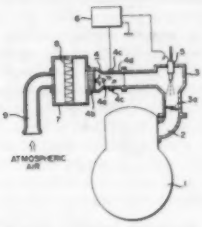
PCT No. PCT/JP81/00097, § 371 Date Dec. 21, 1981, § 102(e) Date Dec. 21, 1981, PCT Pub. No. WO81/03523, PCT Pub. Date Dec. 10, 1981

PCT Filed Apr. 23, 1981, Ser. No. 328,545

Claims priority, application Japan, May 26, 1980, 55-70574

Int. Cl.³ F02B *00/00*

U.S. Cl. 123—494 5 Claims



1. An electronically controlled fuel injection apparatus for an internal combustion engine, comprising:

a Karman vortex flow meter for detecting the intake airflow volume of the engine and generating a frequency output corresponding to the number of vortexes detected; and

an electromagnetic fuel injection valve downstream of said flow meter for injecting fuel synchronously with the frequency output from said Karman vortex flow meter, said vortex flow meter having a vortex generating member with a size for, at the air flow speed past said vortex generating member at the idling speed of the engine, giving a Reynolds number in the vicinity of the Reynolds number at which the Strouhal number is substantially a maximum in the low flow velocity range of the vortex flow meter.

4,433,664

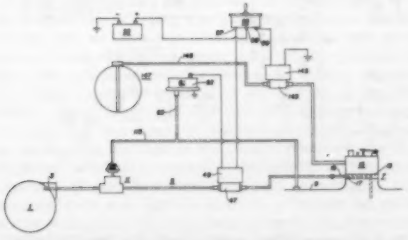
FUEL SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

John J. Rodrigues, 23 Hall Dr., Orinda, Calif. 94563

Filed Jul. 17, 1980, Ser. No. 169,728

Int. Cl.³ F02B *43/00*

U.S. Cl. 123—527 7 Claims



1. A gaseous fuel system for an internal combustion engine comprising a tank for holding gas in liquified form under substantial normally high pressures deemed risky under the hood of an internal combustion engine, a discharge fitting on said tank exposed at all times, inwardly of said tank, to gaseous atmosphere within said tank, when said tank has such liquified gaseous fuel content to assure gaseous discharge at all times despite said pressurized liquified content, a discharge line from said discharge fitting and terminating in means for flow coupling said line to an intake manifold of such internal combustion engine, and a pressure regulator connected in said line in proximity to said tank for reducing such normally high tank pressures to materially lower values deemed safe when supplied at such low values to such internal combustion engine.

4,433,665

DEVICE FOR CONTROLLING CHOKE VALVE IN CARBURETOR FOR INTERNAL COMBUSTION ENGINE

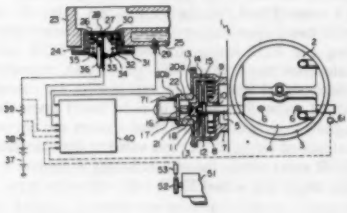
Seiko Abe, Kariya; Toshihiko Igashira, Toyokawa; Hisasi Kawai, Toyohashi; Toshikazu Ina, Aichi, and Masayoshi Tokoro, Susono, all of Japan, assignors to Nippon Soken, Inc., Nishio and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed Mar. 23, 1982, Ser. No. 361,099

Claims priority, application Japan, Mar. 23, 1981, 56-38922[U]

Int. Cl.³ F02M *1/02*

U.S. Cl. 123—552 11 Claims



1. A device for controlling a choke valve in a carburetor for an internal combustion engine having an intake manifold, comprising:

intake air heating means, having a heating surface and a bottom surface opposite said heating surface, for heating intake air;

temperature detecting means for detecting the temperature of said heating surface of said heating means;

control circuit means, responsive to a signal from said temperature detecting means, for generating an output signal related to the detected temperature of said heating surface; and

driving means, responsive to said output signal of said control circuit means, for changing the degree of opening of said choke valve.

8. A method for controlling a choke valve in a carburetor for an internal combustion engine having an intake manifold comprising the steps of:

monitoring the temperature of a heating surface of heating means for heating intake air; and

controlling the degree of opening of said choke valve in response to said monitoring step.

4,433,666

EXHAUST GAS RECIRCULATION SYSTEM FOR DIESEL ENGINE

Kenji Masaki, Yokohama, and Seishi Yasuhara, Yokosuka, both of Japan, assignors to Nissan Motor Co., Limited, Yokohama, Japan

Filed Apr. 5, 1982, Ser. No. 365,589

Claims priority, application Japan, Apr. 7, 1981, 56-51984

Int. Cl.³ F02M *25/06*

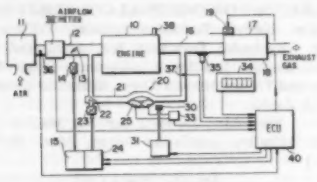
U.S. Cl. 123—569 12 Claims

1. In an automotive vehicle having a diesel engine including an intake passage provided therein with a throttle valve for

controlling the rate of air flow to said engine, an exhaust passage, an EGR passage connected at its one end to said exhaust passage and at the other end to said intake passage downstream of said throttle valve, said EGR passage having therein an EGR valve for controlling the rate of exhaust gas flow recirculated through said EGR passage, an EGR control system comprising:

(a) a first sensor adapted to generate an output signal indicative of the rate of recirculated exhaust gas flow through said EGR passage;

(b) a second sensor adapted to generate a check signal each time said vehicle travels a predetermined distance;



(c) a third sensor adapted to generate an output signal indicative of the rate of air flow to said engine; and

(d) a control unit calculating a target value for the EGR ratio based upon engine operating parameters and controlling said EGR valve to maintain the EGR ratio at the calculated target value, said control unit, responsive to the check signal from said second sensor, for calculating an actual value for the EGR ratio based upon the output signals from said first and third sensors and correcting the calculated target EGR ratio value or the calculated actual EGR ratio value, thereby reducing a deviation between the target and actual EGR ratio values to zero.

4,433,667

APPARATUS FOR REGULATING THE EXHAUST GAS RECIRCULATION RATE IN INTERNAL COMBUSTION ENGINES HAVING SELF-IGNITION

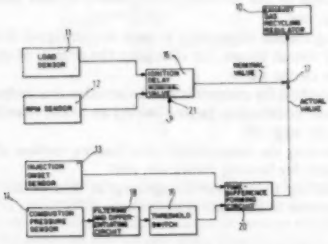
Wolfgang Ripper, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 15, 1982, Ser. No. 398,730

Claims priority, application Fed. Rep. of Germany, Sep. 2, 1981, 3134631

Int. Cl.³ F02M *25/06*

U.S. Cl. 123—569 **11 Claims**



1. In a control device for regulating the exhaust gas recycling rate in an internal combustion engine with self-ignition, the improvement comprising:

means for detecting the ignition delay in at least one cylinder of the engine and generating an actual value signal proportional thereto;

means for generating a nominal value signal of the ignition delay which is dependent on engine operating characteristics; and

means for adjusting the actual value signal to the nominal value signal.

4,433,668

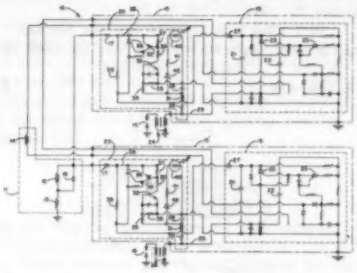
CAPACITOR DISCHARGE IGNITION SYSTEM HAVING A CHARGING CONTROL MEANS

Arthur O. Fitzner, Fond du Lac, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Dec. 14, 1981, Ser. No. 330,419

Int. Cl.³ F02P *3/06, 11/06*

U.S. Cl. 123—597 **9 Claims**



1. A capacitor discharge ignition system for an internal combustion engine, comprising:

(A) an energy source;

(B) a power capacitor connected to be charged by said energy source;

(C) a main electronic switch connected to discharge said power capacitor and fire a spark plug of said engine; and

(D) a charging control means connected in circuit with said energy source, said power capacitor, and said main electronic switch to limit current flow from said energy source to said power capacitor should said power capacitor or said main electronic switch fail.

4,433,669

PLASMA IGNITION SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

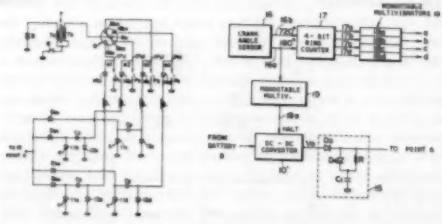
Yasuki Ishikawa; Hiroshi Endo, both of Yokosuka; Masazumi Sone, Tokyo, and Iwao Imai, Yokosuka, all of Japan, assignors to Nissan Motor Company, Limited, Kanagawa, Japan

Filed Jun. 7, 1982, Ser. No. 386,781

Claims priority, application Japan, Jun. 12, 1981, 56-85523

Int. Cl.³ F02P *15/00*

U.S. Cl. 123—620 **5 Claims**



1. A plasma ignition system for an internal combustion engine having a plasma ignition plug within each engine cylinder, which comprises:

(a) a low DC voltage supply;

(b) high surge voltage generating and distributing means which generates a high surge voltage on a basis of the low

DC voltage from said low DC voltage supply and distributes the high surge voltage into one of the plasma ignition plugs according to a predetermined ignition order so as to generate a spark discharge at the plasma ignition plug;

(c) plasma ignition energy generating means which generates a high DC voltage on a basis of the low DC voltage from said low DC voltage supply so as to provide a plasma ignition energy for each plasma ignition plug;

(d) a plurality of plasma ignition energy charging means each connected to said plasma ignition energy generating means and each of which receives the high DC voltage generated from said plasma ignition energy generating means so as to charge the plasma ignition energy for a corresponding plasma ignition plug;

(e) a plurality of switching elements each connected to said plasma ignition energy generating means and each of which turns on in response to a trigger pulse inputted thereinto according to the predetermined ignition order so as to apply the plasma ignition energy within said corresponding plasma ignition energy charging means across the corresponding plasma ignition plug; and

(f) auxiliary turned on interval extending means, connected to said plasma ignition energy generating means in parallel with each of said switching elements, which extends the turned-on interval of time of each of said switching elements so as to fully discharge the plasma ignition energy within one of said plasma ignition charging means into the corresponding plasma ignition plug,

whereby the plasma ignition can securely be carried out at each plasma ignition plug.

4,433,670

ENGINE IGNITION SYSTEM

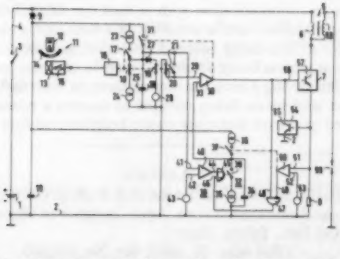
Adolf R. Fritz, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 3, 1982, Ser. No. 374,254

Claims priority, application Fed. Rep. of Germany, May 12, 1981, 3118680

Int. Cl.³ F02P 1/00

U.S. Cl. 123—644 **14 Claims**



1. An ignition system for internal combustion engine including an ignition coil having a primary winding and a secondary winding and an electronic interrupter in series with said primary winding and also an engine driven signal generator having a first switching path for timing the ignition moment at which said interrupter is caused to interrupt the current of said primary circuit when said first switching path switches over from one state to another, the ignition system including means for causing the duration of the conducting condition of said electronic switch, as compared to the duration of the switching condition of said first switching path immediately before switching over at an ignition moment, to become increasingly shorter as engine speed slows, said system having also a storage element and means for providing a first change of the storage content thereof over the duration of the condition of said first switching path that follows immediately after an ignition moment and thereafter a change of said storage content in the other direction and means for the switching over of said electronic interrupter into its conducting state when said storage content reaches a threshold value during said second change of said storage content, as well as means for modifying said threshold value by means of a regulating value dependent at least in part on engine speed, in which system, in accordance with the invention there are also provided:

a monitoring circuit responsive to the storage contents of said storage element for providing a signal when said storage content reaches a reference value that corresponds to an engine speed lying below the idling speed of the engine and for thereby modifying said regulating value so that said threshold value is reached sooner.

4,433,671

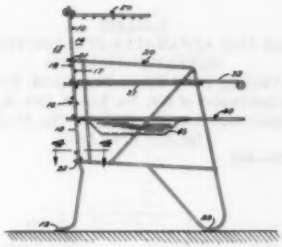
PORTABLE COOKING IMPLEMENT

Ferdinando DeAmicis, 9560 John Street Rd., Thunder Bay, Ontario, Canada

Filed May 6, 1982, Ser. No. 375,354

Int. Cl.³ F24C 1/16

U.S. Cl. 126—9 R **8 Claims**



1. A folding portable cooking implement comprising, in combination;

frame means, to be disposed in a generally vertical plane, and including a lower ground engaging portion and a plurality of vertically spaced apart work frame support means spaced alternately on opposite sides of said frame means and adapted to removably receive and support a work frame;

a plurality of stabilizer means rotatably disposed on said frame means for rotation about a vertical axis in the plane of said frame means between folded positions adjacent said frame means and extended positions forwardly of said frame means and including ground engaging support means adjacent their lower outer portions and

a plurality of work frames each being held between a pair of adjacent work frame support means to support said work frames in a generally horizontal position forwardly of said frame means.

4,433,672

SOLAR ENERGY MODULATOR

Robert R. Hale, Upland, and Allan R. McDougal, La Canada, both of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jul. 17, 1981, Ser. No. 284,286

Int. Cl.³ F24J 3/02

U.S. Cl. 126—419 **3 Claims**

1. A solar energy flux modulator for a solar energy receiver optically coupled with a parabolic dish mirror and characterized by a solar flux acceptance opening having an axis coincident with the optic axis of the mirror, comprising:

A. a solar flux modulator plate interposed between said mirror and said receiver and having a central opening concentric with said axis;

B. means for establishing along said optical axis a graduated

shade zone from said flux opening and toward said mirror; and

C. moveable support means for displacing said modulator

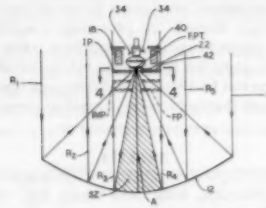


plate from a first minimum shade position adjacent said acceptance opening to a second and more shaded position remote from said acceptance opening, while maintaining the concentricity of said central opening with said axis.

4,433,673

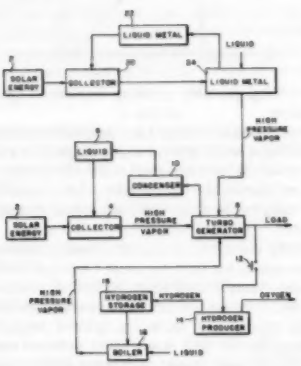
METHOD AND APPARATUS FOR CONTINUOUSLY SUPPLYING A LOAD

Donald E. Vierling, 11309 Toledo Dr., Austin, Tex. 78759

Continuation-in-part of Ser. No. 81,876, Oct. 4, 1979. This application Aug. 25, 1982, Ser. No. 411,549

Int. Cl.[3] F24J *3/02*

U.S. Cl. 126—435 6 Claims



1. The method of continuously supplying a load by means of solar energy which comprises collecting solar energy and immediately producing useable energy therefrom to supply said load, at the same time collecting a further amount of solar energy to heat a molten metal to a high temperature, storing said heated metal until solar energy is not available, the amount of said stored energy being sufficient to supply said load for at least the majority of time solar energy is not available during a normal day, collecting a further amount of solar energy to produce hydrogen, and utilizing said hydrogen to supply said load when the first two energy supplies are exhausted.

4. Apparatus for continuously supplying a load by means of solar energy which comprises means for collecting solar energy, means for immediately producing useable energy from a portion of said collected energy to supply said load, a liquid metal storage means, means for feeding a second portion of said collected energy to said liquid metal storage means, means utilizing the energy in said stored liquid metal to supply said load when solar energy is not available, a hydrogen generator, means feeding a third portion of said collected energy to said hydrogen generator, hydrogen storage means connected to said hydrogen generator, and means utilizing said hydrogen to supply said load when the first two energy supplies are exhausted.

4,433,674

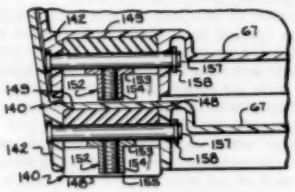
SOLAR COLLECTOR HAVING RESILIENT AND ADJUSTABLE MOUNTING MEANS

Frank W. Gilleland, Toledo, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Dec. 23, 1981, Ser. No. 334,018

Int. Cl.[3] F24J *3/02*

U.S. Cl. 126—450 3 Claims



1. A solar collector assembly comprising an absorber means adapted to transfer heat to a fluid moving therealong; a solar energy transmitting cover member; a housing adapted to contain said absorber means, said housing having a collar section extending around the periphery thereof; sealing means located at the collar section of the housing; a clamping means extending along the collar section to substantially uniformly bias the transmitting member toward the collar section of the housing, said housing having a bottom wall, sidewalls and a plurality of spaced-apart foot sections adapted to receive a plurality of after-defined elastomeric bodies, said sidewalls being tapered and extended to form at least a portion to said foot sections; and elastomeric bodies fastened within said foot sections, said elastomeric bodies having an articulated slot adapted to slideably receive an insert adapted to engage a fastener means associated with a mounting bracket to movably secure said housing to said bracket, said articulated slot having a channel section in communication with at least one laterally extending undercut section, said insert having a base and a sleeve, said channel section being adapted to receive said sleeve and said undercut section being adapted to receive said base, said articulated slot having a recess in communication with said undercut section, said recess being adapted to receive a retainer means adapted to secure said elastomeric body to said foot section.

4,433,675

LIGHT SUPPLY APPARATUS FOR ENDOSCOPE

Katunaga Konoshima, Tokyo, Japan, assignor to Olympus Optical Co. Ltd., Tokyo, Japan

Filed Mar. 25, 1982, Ser. No. 361,885

Claims priority, application Japan, Apr. 1, 1981, 56-49183

Int. Cl.[3] A61B *1/06*

U.S. Cl. 128—6 12 Claims

1. An apparatus for supplying an illumination light to an endoscope which includes a light guide means for transmitting the light to the endoscope and a connector member coupled to the light guide means, said apparatus comprising:

(a) a housing;

(b) light source means, provided within said housing and connected to a power source section, for receiving electric power supplied from the power source section and for emitting light;

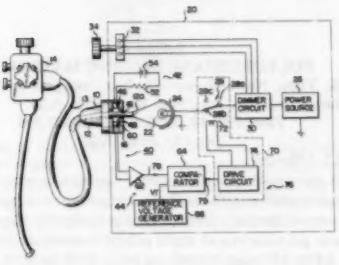
(c) a socket member which is mounted on said housing and to which said connector member of said endoscope is detachably connected, said socket member having an opening through which said light guide means penetrates when said connector member is connected thereto; and

(d) light control means for optically detecting a connection and disconnection of said connector member to and from

said socket member, and for reducing an amount of light emitted from said light source means and transmitted to said opening of said socket member when said connector member is disconnected from said socket member, whereby the amount of light leaking to the outside of said housing through said opening is reduced, said light control means including,

(i) detecting means for photoelectrically detecting the disconnection of said connector member from said socket member, said detecting means having light generating means for generating light of a predetermined light intensity, and signal generating means for receiving the light generated from said light generating means and for generating an output signal when the intensity of the light from said light generating means is changed to a level higher than a predetermined reference level, and

(ii) light attenuation means, connected to said detecting means, for reducing the amount of light which is emitted from said light source means and which reaches said opening in response to said output signal.

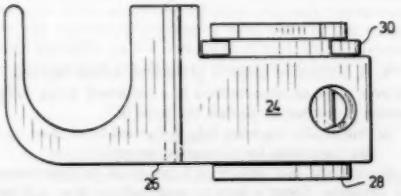


4,433,676

SELF-ADJUSTING SPINAL SCOLIOSIS FUSION HOOK

Kevin A. Bobechko, 178 St. George St., Toronto, Ontario, Canada M5R 2N2

Filed Mar. 29, 1982, Ser. No. 362,757
Claims priority, application Canada, Apr. 6, 1981, 374769
Int. Cl.³ A61F 5/00
U.S. Cl. 128—69 **14 Claims**



14. A hook for use with a Harrington rod for the treatment of spinal disorders, said hook comprising:

a stainless steel body portion having a housing portion with a flat, upper surface, at one end, and a

substantially U-shaped hook at the other end, the height of the hook being greater than the height of said housing portion, said housing portion having an elliptically-shaped channel therethrough;

a cylindrical, stainless steel sleeve adapted to be inserted and retained in said channel, said sleeve having a first retaining lip on one surface and a second retaining lip on the opposite surface, said first retaining lip being truncated along two opposite sides, the outer diameter of the second retaining lip being greater than the width of said channel, and the outer diameter of said first retaining lip across said truncated sides being less than the width of said channel, the length of said sleeve being greater than the length of said channel;

a ridge on the interior surface of said sleeve at approximately one-half the length of said sleeve;

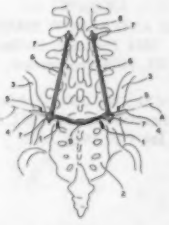
a stainless steel, resilient C-shaped locking ring adapted to be inserted on said sleeve between said first retaining lip and the top of said housing portion when said sleeve is inserted through said channel.

4,433,677

IMPLANTABLE SPLINT FOR CORRECTING LUMBOSACRAL SPONDYLODESIS

Max B. Ulrich, Amselweg 55, D-7900 Ulm, and Heinrich Ulrich, Ulm, Fed. Rep. of Germany, assignors to Max Bernhard Ulrich, Ulm, Fed. Rep. of Germany

Filed May 28, 1982, Ser. No. 383,175
Claims priority, application Fed. Rep. of Germany, May 29, 1981, 3121272
Int. Cl.³ A61F 5/04
U.S. Cl. 128—69 **6 Claims**



1. A spinal distraction splint comprising:

two like anchor screws extending along respective longitudinal screw axes and adapted to be anchored in the pelvis with said axes crossing, each of said screws having a head formed with a transversely open recess centered on a respective transverse axis and with an annular array of teeth centered on the respective transverse axis;

a bolt extending through one of said recesses and threaded in the other recess, said bolt securing said heads together with said transverse axes coaxial and said teeth interengaged; and

respective distraction rods each having one end adapted to be braced on the respective screw and another end adapted to be braced oppositely against a vertebra.

4,433,678

DISPOSABLE ORTHOPEDIC SUPPORT

Donald C. Spann, 5 Ferncreek Ct., Greenville, S.C. 29615

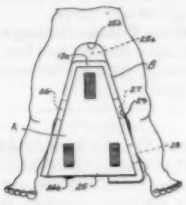
Division of Ser. No. 5,495, Jan. 22, 1979, Pat. No. 4,327,714, which is a continuation-in-part of Ser. No. 780,761, Mar. 24, 1977, Pat. No. 4,135,504. This application Oct. 19, 1981, Ser. No. 312,537
The portion of the term of this patent subsequent to Jan. 23, 1996, has been disclaimed.
Int. Cl.³ A61F 3/00
U.S. Cl. 128—80 A **6 Claims**

4. An abduction pillow for immobilizing the lower limbs of an orthopedic patient comprising:

a wedge shaped body having a thickness and configuration defined by first and second ends and first and second sides diverging outwardly from said second end terminating at said first end;

an elongated outer cover strip of synthetic foam material adapted for being removably fastened to said wedge shaped body and wrapped about at least a portion of said first and second sides and said second end facilitating reuse of said wedge shaped body; and

means extended about the legs of the patient and fastened to said wedge shaped body fixing said legs against said outer cover strip at respective sides of said wedge shaped body,



said wedge shaped body between said outer cover strip and said sides maintaining said legs in divergent fixed positions corresponding generally to the divergent configuration of said sides.

4,433,679

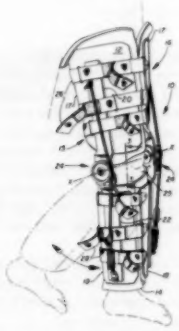
KNEE AND ELBOW BRACE

Donald M. Mauldin, 3631 Potomac, Dallas, Tex. 75235, and Richard E. Jones, III, 5804 Prestonview, Apt. 1089, Dallas, Tex. 75240

Continuation-in-part of Ser. No. 260,075, May 4, 1981, Pat. No. 4,370,977. This application Sep. 29, 1982, Ser. No. 426,981

Int. Cl.³ A61F *3/00*

U.S. Cl. 128—80 F **10 Claims**



1. A hinge joint for a knee brace comprising:

an adjusting disc having opposed first and second circular faces;

the first circular face of the adjusting disc comprising a plurality of first teeth positioned at circumferentially equally spaced points;

the second circular face of the adjusting disc comprising a tooth having a predetermined circumferential dimension;

a first hinge portion comprising a face having a plurality of teeth positioned at circumferentially equally spaced points and dimensioned to mate with the teeth of the first circular face of the adjusting disc to lock the adjusting disc and the first hinge portion against rotational movement with respect to each other;

a second hinge portion comprising a face having a plurality of slots formed therein, each for selective mating engagement with the tooth of the second circular face of the adjusting disc and each characterized by a different circumferential dimension so that the tooth of the second circular face of the adjust disc and the slots of the face of the second hinge portion permit relative pivotal movement between the second hinge portion and the adjusting disc, depending upon which of the slots receives the tooth; and

fastening means extending through the first and second hinge portions and the adjusting disc for maintaining the teeth of the first circular face of the adjusting disc in mating engagement with the teeth of the face of the first hinge portion and for maintaining the tooth of the second circular face of the adjusting disc in engagement with a selected slot of the face of the second hinge portion.

4,433,680

POLYURETHANE CASTING MATERIAL

Hee K. Yoon, North Brunswick, N.J., assignor to Johnson & Johnson Products, Inc., New Brunswick, N.J.

Filed Feb. 10, 1982, Ser. No. 347,596

Int. Cl.³ A61F *5/04*

U.S. Cl. 128—90 **6 Claims**

1. A storage-stable orthopaedic cast bandage comprising a water-activatable polyurethane prepolymer coated on an open-weave fibrous substrate, said prepolymer comprising an aromatic polyisocyanate and a polyol in an equivalent ratio of from 2:1 to 15:1 and containing from 0.1% to 10%, based on the weight of prepolymer, of dimorpholinodiethylether as a catalyst.

4,433,681

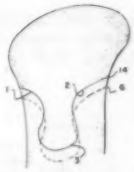
BONE ELONGATION OR SHORTENING METHOD

John E. Comparetto, P.O. Box 433, Nassawadox, Va. 23413

Continuation of Ser. No. 32,310, Apr. 23, 1979, abandoned, which is a continuation-in-part of Ser. No. 763,623, Jan. 28, 1977, Pat. No. 4,150,675. This application Jul. 7, 1981, Ser. No. 280,977

Int. Cl.³ A61F *5/04*

U.S. Cl. 128—92 E **7 Claims**



1. A corrective surgical procedure which corrects or improves upon an imperfection in a deformed living long bone which procedure comprises the steps of:

(a) Surgically exposing thhe deformed bone at an operative site auspicious for corrective surgery,

(b) cutting said deformed bone so as to sever same and thereby form a loosely interlocking dove-tail joint in adjacent osseous tissue of said long bone at said site,

(c) correctively reorienting the relative position of the interlocked adjacent parts of said surgically severed long bone within the limits of said loosely interlocking dovetail-like joint,

(d) stabilizing said severed long bone in said reoriented corrective position,

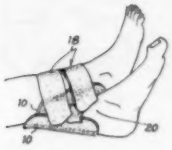
(e) closing said operative site in a manner conducive to tissue regrowth,

(f) wherein said step of severing further includes producing multiple curvalinear cuts which each have a cross section substantially in the shape of the capital Greek letter omega (Ω) whereby said interlocking dovetail-like joint is formed by said curvilinear cuts.

4,433,682
ANKLE PROTECTOR

Sami A. Badra, 6186 College Ave., San Diego, Calif. 92101

Filed Mar. 1, 1982, Ser. No. 353,318
Int. Cl.³ A61F 5/30, 3/00, 13/06
U.S. Cl. 128—153 1 Claim

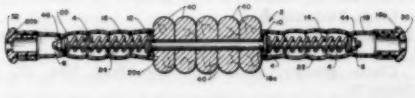


1. A pair of ankle and calf protectors, each comprising:
(a) a planar panel of resilient foam material having front and rear surfaces and top and bottom edges and being shaped to wrap around the rear of the ankle and lower calf, and having a concave cutaway portion defined in its bottom edge to fit the heel of the user;
(b) said panel having a lateral dimension sufficient to wrap around a portion of the ankle and lower calf and being sufficiently small to wrap around a small ankle without overlapping onto itself;
(c) strap means for securing said panel around an ankle, said strap means being secured at one end to the rear surface of said panel and the other end being removably securable at adjustable positions to the rear surface of said panel, whereby said panel can be applied against the rear of the ankle with said strap means wrapped around the front of the ankle and secured to the rear surface of the panel,
(d) said strap means comprise two bands of wide, parallel closely adjacent straps of resilient foam material to substantially cover the front of the ankle and calf over an area on the order of at least three-fourths of the height of said panel to protect the front of the ankle and calf as well as hold said panel in place;
(e) said foam straps being faced with a bonded fabric and said panel defining a hook-type fasteners on the rear surface thereto to engage said fabric at selectable portions along the lengths of said straps and retain said panel snugly on the ankle due to the resilient nature of the straps; and
(f) each of the protectors of said pair having said hook-type fasteners and straps on the opposite side of said panel from the other of the said protectors such that such pair defines left and right-hand protectors with ends of the straps being wearable on the outer side of each leg to prevent brushing against the straps of the other protector of said pair.

4,433,683
EXERCISE-MASSAGING DEVICE

Kenneth H. McCoy, Santa Monica, Calif., and John Romain, 1629 Veteran Ave., Los Angeles, Calif. 90074, assignors to John Romain, Los Angeles, Calif.

Filed Jun. 29, 1981, Ser. No. 278,636
Int. Cl.³ A61H 15/00
U.S. Cl. 128—57 9 Claims



1. A hand-held exercise-massage device comprising the combination: an elongate support member defining an axis, handle members slidably mounted on said elongate support member in the vicinity of opposite ends thereof and being capable of being grasped by the human hand, at least one rotatable element having an aperture therein for receiving said elongate support member and being rotatably and centrally mounted thereon between and independently of said handle members and being of a size greater in diameter than said handle members and adapted to impart a massaging action, and spring-biasing means cooperatively engaging each of said handle members so as to provide resilient resistance to said handle members during movement along said axis, said handle members being capable of movement along said axis toward and away from and independently of said at least one rotatable element.

4,433,684
ASSEMBLY FOR ADMINISTERING RESPIRATORY MEDICAMENT DOSAGE THROUGH A GAS MASK

Stanley J. Sarnoff, Bethesda, Md.; Rudolph S. Malooley, Annandale, Va.; George B. Calkins, and William R. Tarello, both of Bethesda, Md., assignors to Survival Technology, Inc., Bethesda, Md.

Filed Mar. 18, 1981, Ser. No. 244,913
Int. Cl.³ A61M 15/00
U.S. Cl. 128—203.21 4 Claims

1. In a gas mask including a face blank arranged to be peripherally sealed with the wearer's face and a breathing inlet having an exterior filter communicating therewith, the improvement which comprises
means including an annular adapter member between said inlet and said filter defining a passage extending radially through said adapter member communicating with the interior of the face blank and exteriorly thereof,
said annular member having an exterior threaded portion disposed in surrounding relation with the exterior of said passage,
normally closed valve means in said passage,
coupling means for sealingly connecting with the passage,
a container disposed in sealing relation with said coupling means having a respiratory medicament therein, and
means for releasing successive predetermined dosages of said respiratory medicament from said container through said coupling means into the interior of said face blank,
said coupling means including a threaded member threadedly engaged with said threaded portion to fixedly secure said threaded member thereto in air excluding sealed relation with respect to the exterior of said passage, a tubular outlet extending from said container in alignment with said passage, flexible shroud means connected with said threaded member and disposed in sealing relation with said tubular outlet, and diaphragm means for provid-

ing a seal over said passage, said tubular outlet being adapted to pass through said passage and including means for piercing said diaphragm means and for moving said valve means therein from its normally closed position into an open position.

4,433,685

PRESSURE DEMAND REGULATOR WITH AUTOMATIC SHUT-OFF

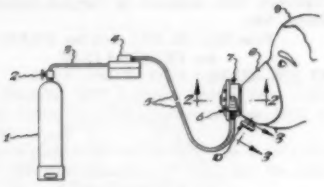
Eugene A. Giorgini, Cheektowaga, N.Y., and John L. Sullivan, Fort Erie, Canada, assignors to Figgie International Inc., Willoughby, Ohio

Division of Ser. No. 185,894, Sep. 10, 1980, Pat. No. 4,345,592. This application Aug. 23, 1982, Ser. No. 410,489

The portion of the term of this patent subsequent to Aug. 24, 1999, has been disclaimed.

Int. Cl.³ A62B *7/04*

U.S. Cl. 128—204.26 **7 Claims**



1. In a pressure demand breathing apparatus including

a face mask providing a mask chamber when fitted against the face of a user;

line means including an air supply line and being capable of connecting said mask to a pressurized air supply;

a pressure demand regulator positioned in said line means and including a valve responsive to pressure within said mask chamber and capable of admitting pressurized air to said mask chamber for a period of time required for respiration determined by the pressure within the mask chamber falling below a predetermined positive pressure;

the improvement comprising

shutoff means capable of interrupting air flow through said line means when the shut-off means senses air flow in excess of a preselected rate; and

time delay means interconnected with said shutoff means and capable of preventing said shut-off means from interrupting the air flow for a preselected period of time after the shut-off means senses air flow in excess of the preselected rate, said preselected period of time being longer than said period of time required for respiration.

4,433,686

TRIMMING AID

John Charnley, Knutsford, England, assignor to Charnley Surgical Inventions Limited, Knutsford, England

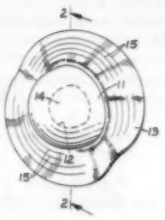
Filed Oct. 2, 1981, Ser. No. 307,793

Claims priority, application United Kingdom, Nov. 1, 1980, 8035185; Sep. 3, 1981, 8126702

Int. Cl.³ A61B *17/00*; A61F *1/03*

U.S. Cl. 128—303 R **6 Claims**

1. A trimming aid, for use in the trimming of the flange of an acetabular prosthesis of the kind described, said trimming aid comprising a body component of approximately hemispherical configuration and having a face wherein is a socket (said body component corresponding in dimensions and configuration with the socket member of the acetabular prosthesis with which it is to be used) and a separate flanged component comprising a flange (said flange corresponding in dimensions and configuration to the flange of the said prosthesis) and having a central protrusion which is an interference fit into the socket of the body component of the trimming aid, whereby said body component and flanged component, when put together, define



an assembly of overall configuration corresponding to the acetabular prosthesis.

4,433,687

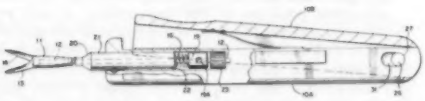
MICROSURGICAL SCISSORS

Roger M. Burke, Weston; Allen H. DeSatnick, Boston, and George P. Honkanen, North Scituate, all of Mass., assignors to Acufex Microsurgical, Inc., Norwood, Mass.

Continuation of Ser. No. 146,100, May 2, 1980, abandoned. This application Mar. 26, 1982, Ser. No. 362,400

Int. Cl.³ A61B *17/32*

U.S. Cl. 128—318 **6 Claims**



1. In a microsurgical scissors comprising:

a handle for gripping the scissors;

a tubular shaft extending forward from the handle and having a blade on the forward end of the shaft;

a rotatable rod within the shaft, the rod having a blade on its forward end for engaging the shaft blade, the rod blade and the shaft blade each having a cutting edge, the cutting edges being angled to intersect in a shearing relationship; and actuating means associated with the handle for rotating the rod, and thereby rotating the rod blade past the shaft blade in a shearing relationship so that the point of contact travels along the blades; the improvement wherein the blades are arcuate in form about the axis of the rod and shaft, said arcuate shape forming means for said blades to nest one in the other, and wherein the scissors comprise biasing means for urging the rod in a longitudinal direction with respect to the shaft, and thereby bearing the cutting edges of the rod and shaft blades against each other at a point of contact and wherein the cutting edges of the blades are angled with respect to each other in the circumferential direction of the rod, and tilted outward with respect to the axis of the rod and shaft.

4,433,688

METHOD OF COATING A CATGUT SUTURE

Daniel Bichon, Gaillard, France, assignor to Assut S.A., Lausanne, Switzerland

Division of Ser. No. 279,972, Jun. 30, 1981. This application Jan. 4, 1983, Ser. No. 455,495

Claims priority, application Switzerland, Nov. 23, 1979, 10449/79

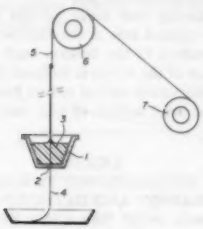
Int. Cl.³ A61L *17/00*

U.S. Cl. 128—335.5 **8 Claims**

1. A method for obtaining a sheathed catgut suture filament comprising the following steps:

Polymerizing at least one diacid with one or more of an equivalent of at least one polyol, thus providing a hydroxylated polyester,

Capping said polyester with between one and two equiva-



lents of at least one polyisocyanate, thus providing an isocyanate capped polymer,

Capping a catgut filament with at least one layer of the isocyanate capped polymer, and

Curing said coated filament in non-dry conditions.

4,433,689

SURGICAL CLAMP FOR VESSELS

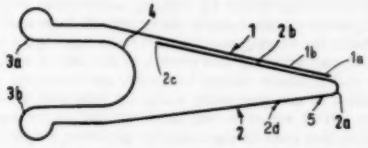
Dieter von Zeppelin, Wittelsbacher Str. 20, D-8000 Munchen 5, Fed. Rep. of Germany

Filed Feb. 25, 1981, Ser. No. 237,979

Claims priority, application Fed. Rep. of Germany, Mar. 3, 1980, 3008122

Int. Cl.³ A61B *17/12*

U.S. Cl. 128—346 **2 Claims**



1. A surgical clamp for vessels, said clamp comprising a single strip of resilient spring material formed to have an arched section at a rear end thereof and first and second jaw-forming sections extending forwardly of said arched section, said first jaw-forming section comprising a first portion of said strip which extends forwardly to a forward end of said first jaw-forming section and terminates at such forward end, said second jaw-forming section comprising a second portion of said strip which extends forwardly to a forward end of said second jaw-forming section and then reverses direction to define a third portion of said strip extending rearwardly adjacent said first portion, said third portion terminating at a location rearwardly of said forward end of said first jaw-forming section, said second portion being longer than said first portion, the first and third portions being resiliently separable to receive therebetween a vessel to be clamped whereby a substantially uniform clamping force is obtained over the entire coincident lengths of the first and third portions.

4,433,690

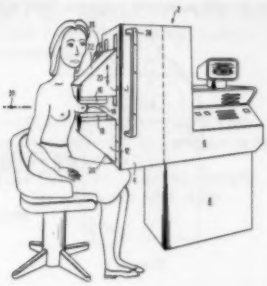
COMPACT ULTRASOUND APPARATUS FOR MEDICAL EXAMINATION

Philip S. Green, Atherton, and Jon C. Taenzer, Palo Alto, both of Calif., assignors to Siemens AG, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 20, 1981, Ser. No. 284,930

Int. Cl.³ A61B *10/00*

U.S. Cl. 128—660 **14 Claims**



1. An ultrasound apparatus for medical examination of a patient's breast; comprising in combination:

(a) an ultrasonic wave-generating transducer for providing ultrasonic waves;

(b) a first horizontal ultrasound window;

(c) first guiding means containing a fluid medium for guiding said ultrasonic waves to said first horizontal ultrasound window;

(d) a second horizontal ultrasound window;

(e) each of said first and second ultrasound windows defining an examination gap for introducing and insonifying the patient's breast positioned therein with ultrasonic waves having a vertical main axis;

(f) an ultrasonic receiving transducer for converting at least a portion of an acoustic image field received from said gap to electrical signals;

(g) second guiding means containing a fluid medium for guiding ultrasound transmitted through said gap from said second ultrasound window to said ultrasound receiving transducer;

(h) lens means associated with said second guiding means for focusing said acoustic image field from said gap at said ultrasonic receiving transducer and for forming an image of the patient's breast thereon; and

(i) a rocking mirror associated with said second guiding means for deflecting ultrasound energy passing through said gap towards said receiving transducer in a direction which is different from said main insonification direction in said gap, wherein said rocking mirror is movable about a rotation axis for sweeping said acoustic image field across said receiving transducer.

4,433,691

MOVING TORQUE COIL OSCILLATORY DRIVE MEMBER

Bernard F. Bickman, New Brighton, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 5, 1981, Ser. No. 308,706

Int. Cl.³ A61B *5/10*

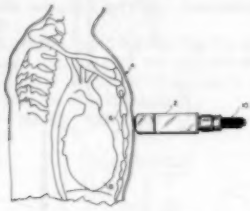
U.S. Cl. 128—660 **8 Claims**

1. An oscillatory driver apparatus comprising:

a field pole piece assembly including means defining a fixed polarized magnetic field, said field pole piece assembly being substantially arcuate about a predetermined center of curvature and including a first and a second outer pole piece member and an inner pole piece member, said first

and second outer pole piece members being spaced, respectively, from opposite faces of said inner pole piece member, said inner pole piece member being symmetrically tapered from a minimum thickness dimension at the center of said pole piece assembly to a maximum thickness dimension at the ends thereof;

armature means mounted for oscillatory motion about a pivot point coincident with said center of curvature, said armature means including a torque coil mounted to be operative in said polarized magnetic field with said torque



coil being mounted to surround said inner pole piece member and to operate in the spaces between said inner pole piece member and said outer pole piece members;

means for selectively energizing said torque coil with an oscillatory signal to produce a controlled magnetic field which reacts with said fixed polarized magnetic field to impart a magnetomotive force to said armature in accordance with the selective energization therof; and

signal transducing means mounted on and carried by said armature whereby a scanning oscillatory motion is imparted to said transducer directly by said armature.

4,433,692

ULTRASONIC DIAGNOSIS DEVICE

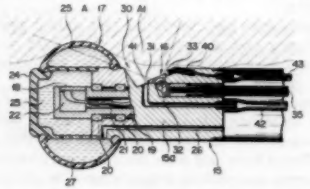
Kazuo Baba, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed May 11, 1982, Ser. No. 377,024

Claims priority, application Japan, May 20, 1981, 56-76079

Int. Cl.³ A61B *10/00*

U.S. Cl. 128—660 **2 Claims**



1. An ultrasonic wave diagnosis device comprising:

an insertion section having one end which is insertable into a body cavity, another end which is located outside the body cavity, and a central axis;

a control section connected to said another end of the insertion section;

an ultrasonic wave transmission/reception scanner disposed at said one end of the insertion section and having an ultrasonic wave oscillator therein;

a balloon inflatable toward the outside and surrounding said ultrasonic wave transmission/reception scanner disposed at said one end of the insertion section;

means disposed in said insertion section for supplying an ultrasonic wave propagation liquid medium to the balloon disposed in said insertion section to inflate the balloon;

said insertion section having a recess formed in part of a circumferential side surface thereof, which is in the vicinity of said balloon; and

an observation optical system disposed within the recess and having a field of sight toward the balloon, said observation optical system including an observation window and an illumination window; and

said recess having one inner surface which is inclined toward the central axis of the insertion section from the insertion section to the balloon such that said inclined inner surface of the recess is inclined toward the balloon, and said observation optical system being disposed in said one inclined inner surface of said recess.

4,433,693

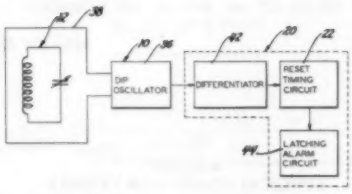
METHOD AND ASSEMBLY FOR MONITORING RESPIRATION AND DETECTING APNEA

Peter A. Hochstein, 14020 Fifteen Mile Rd., Sterling Heights, Mich. 48077

Division of Ser. No. 79,457, Sep. 27, 1979, Pat. No. 4,279,253, which is a continuation-in-part of Ser. No. 783,168, Mar. 31, 1977, abandoned, which is a continuation-in-part of Ser. No. 598,934, Jul. 25, 1975, abandoned. This application May 1, 1981, Ser. No. 259,590

Int. Cl.³ A61B *5/08*

U.S. Cl. 128—721 **8 Claims**



1. An assembly suitable for use in monitoring respiration and detecting apnea in a subject comprising; generating means for generating an electromagnetic field having an output frequency in a predetermined frequency range about the subject, passive circuit means having a resonant frequency variable in said predetermined frequency range and being responsive to said electromagnetic field when said resonant frequency matches said output frequency, transducer means adapted for attachment to the subject for varying said resonant frequency of said passive circuit means in response to the force exerted on said means for varying said resonant frequency by the expansion and contraction of that portion of the subject which expands and contracts during breathing, and detecting means responsive to said generating means for detecting when said passive circuit means is responsive to said electromagnetic field including reset timing means for providing a signal when said passive circuit means fails to respond to said electromagnetic field within a predetermined time period upon each occurrence of said passive circuit means being responsive to said electromagnetic field whereby said signal is provided in the event the subject fails to breathe within said predetermined time period.

4,433,694

DEVICE FOR APPLYING FILTERS TO CIGARETTES

Enzo Seragnoli, Bologna, Italy, assignor to G. D Societa per Azioni, Bologna, Italy

Filed Oct. 6, 1981, Ser. No. 309,162

Claims priority, application Italy, Nov. 17, 1980, 50175 A/80

Int. Cl.³ A24C *5/47*

U.S. Cl. 131—92 **2 Claims**

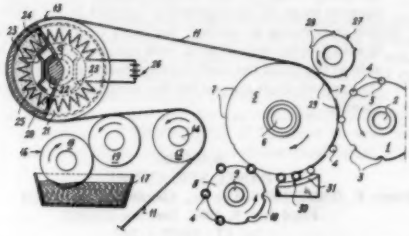
1. A device for applying filters to cigarettes by connection bands, comprising:

a gluing device for applying adhesive material to a web;

means for moving the web from said gluing device to a

position for adhering filters to cigarettes, defined by a rolling drum in combination with a counter-rolling element;

a cutting roller positioned adjacent the rolling drum to act therewith but before the rolling drum acts in combination with the counter-rolling element, for cutting the web into a plurality of bands; and



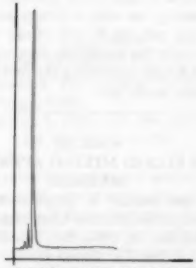
a drying roller positioned between said gluing device and said cutting roller, for almost drying the adhesive material on the web so that when the banded filters and cigarettes leave the adhering position the adhesive material on the band is dry.

4,433,695

PROCESS FOR THE PRODUCTION OF ISOSOLANONE AND SOLANONE, INTERMEDIATES USEFUL IN SAID PROCESS AND ORGANOLEPTIC USES OF SAID INTERMEDIATES

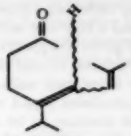
John B. Hall, Rumson; James M. Sanders, Eatontown, and James N. Siano, Keyport, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed May 20, 1982, Ser. No. 380,542
Int. Cl.³ A24B *3/12, 15/32*
U.S. Cl. 131—276 **1 Claim**



GLC PROFILE FOR EXAMPLE I.

1. A process for augmenting or enhancing the aroma or taste of a smoking tobacco or smoking tobacco article comprising the step of adding to a smoking tobacco or smoking tobacco article component, an aroma or taste augmenting or enhancing quantity of a mixture of cis and trans isomers of a compound having the structure:



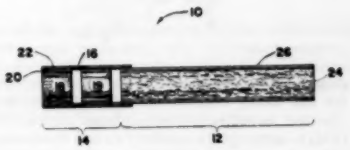
wherein the wavy lines represent cis or trans juxtaposition of the hydrogen and 2-methyl-1-propenyl moieties around the carbon-carbon double bond.

4,433,696

VARIABLE DILUTION FILTER

John M. Adams, Mechanicsville, Va., assignor to Philip Morris Incorporated, New York, N.Y.

Filed Oct. 2, 1981, Ser. No. 307,973
Int. Cl.³ A24D *1/04, 3/00*
U.S. Cl. 131—336 **8 Claims**



1. In a smoking article the improvements which comprise:

a filter mouthpiece attached to one end of said smoking article by air impervious tipping paper;

a second stage filter means mounted in said mouthpiece behind the tobacco portion of said smoking article and free to move in an axial direction in said mouthpiece in response to tapping said mouthpiece on a hard surface;

a first stage filter means rigidly mounted in said mouthpiece behind said second stage filter means such that there is space for axial movement of said second stage filter; and

ventilation holes in said air impervious tipping paper forward of said first stage filter and behind the tobacco portion of said smoking article.

4,433,697

WRAPPER FOR SMOKING ARTICLES AND METHOD

Warren K. Cline, Brevard, and William F. Owens, Pisgah Forest, both of N.C., assignors to Olin Corporation, Pisgah Forest, N.C.

Filed Apr. 7, 1982, Ser. No. 366,314
Int. Cl.³ A24D *1/02, 1/18;* **A24B** *3/14*
U.S. Cl. 131—365 **20 Claims**

8. A smoking article comprising a tobacco charge and a wrapper for the tobacco charge, said wrapper comprising a cellulosic sheet containing a small percentage of ceramic fibers selected from the group consisting of polycrystalline alumina, aluminum-silicate and amorphous alumina and as a filler magnesium hydroxide and/or magnesium oxide coated on or applied to the fibers of the sheet.

4,433,698

HIGH PRESSURE PARTS WASHER

Ronald L. Blaul, Crystal Lake, Ill., assignor to Trigent, Inc., McHenry, Ill.

Filed Jun. 22, 1981, Ser. No. 275,965
Int. Cl.³ B08B *3/02*
U.S. Cl. 134—56 R **14 Claims**

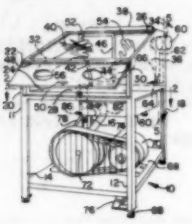
1. Parts cleaner adapted for high pressure hand spraying in a closed system comprising:

a fully enclosed spray chamber (24) including a spaced apart

sealed top wall and floor pan wall, and continuous side walls joining same including a front side wall, an end side wall at an end, and a rear side wall;

a liquidproof pair of glove box gloves (**54**) extending into the spray chamber from one of said side walls and sealed at their bases to the latter, said walls all impervious;

a closed, pump-recirculated liquid recycling circuit for a sprayed on liquid medium to be applied in the cleaner including a filter (**82**) upstream of the pump (**72**) and, on the downstream side, a high pressure hose and hand nozzle (**44**) supplied thereby and together manipulatable in said spray chamber; and



a closed, blower-recirculated atmosphere recycling system for the totally confined air contents contained by the chamber including a vapor-to-liquid agglomerating filter (**136**) to intercept the confined air and its entrained splash-induced spray contents upstream of the blower (**140**) and, on the downstream side, a tower and deflector (**64**) supplied by the blower and together cooperating to remove from the air stream for recycling the recovered liquid and to reintroduce the thus recycled air for continued circulation within its closed confines.

4,433,699

SUNSHADE

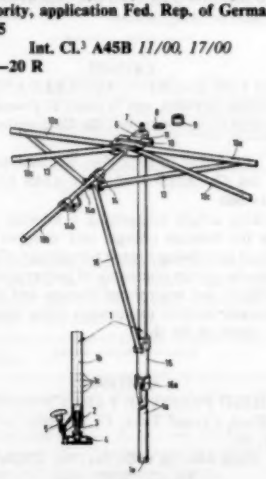
Tilmann Schultes, and Joachim Seidel, both of Solingen, Fed. Rep. of Germany, assignors to Kortenbach & Rauh Kommanditgesellschaft, Solingen, Fed. Rep. of Germany

Filed Nov. 6, 1981, Ser. No. 319,151

Claims priority, application Fed. Rep. of Germany, Nov. 18, 1981, 3043465

Int. Cl.[3] **A45B** *11/00, 17/00*

U.S. Cl. 135—20 R **29 Claims**



1. In a sunshade having a cover which can be folded together in fan-like manner and is supported by at least two support struts which are pivoted at one end to a bearing member, the latter being swingable on a stand bar around at least one horizontal axis and lockable thereon, and a spreading slide for pivoting an outer two of the support struts by means of a spreading strut, respectively, the spreading slide being displaceable and lockable on a central support strut which is connected to the bearing member, the improvement comprising

means comprising an adjustment bar pivoted to the spreading slide, said adjustment bar means for displacing said spreading slide on said central support strut when said support struts lie approximately parallel to the stand bar,

means comprising an opening bar being operatively pivoted to said central support strut, said opening bar being securable to the stand bar, said opening bar means for swinging the support struts around the horizontal axis of the bearing member.

4,433,700

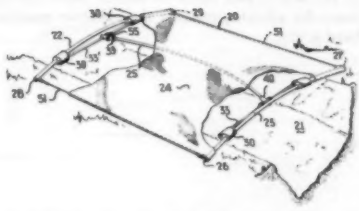
PANEL STRUCTURE

Pierre E. Dohet, 109 S. Lee St., Alexandria, Va. 22314

Filed Jun. 5, 1981, Ser. No. 270,927

Int. Cl.[3] **E04B** *1/347*

U.S. Cl. 135—97 **18 Claims**



1. A shelter structure capable of being assembled and disassembled including at least one free floating rod member having end portions, restraint means attached adjacent to at least each end portion of said rod member, at least one resilient stress bar having a given original length measured on a horizontal plane, end portions on said stress bar, means supporting said restraint means and one end portion of said stress bar remote from said rod member, constraining means operatively disposed between said rod member and the other end portion of said stress bar to guide slidable movement of said stress bar relative to said rod member, said slidable movement being in a plane including the longitudinal axis of said rod member during assembly and disassembly, the above elements being so constructed and arranged that when in assembled position, the stress bar imposes tensile loading on said restraint means, said loading decreasing the said original length of said stress bar, said restraint means limiting the maximum distance between said rod member and said means supporting the restraint means and one end portion of said stress bar.

4,433,701

POLYMER FLOOD MIXING APPARATUS AND METHOD

Bruce M. Cox, and Stanley V. Stephenson, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Jul. 20, 1981, Ser. No. 284,658

Int. Cl.[3] **G05D** *11/13*

U.S. Cl. 137—101.19 **7 Claims**

1. An apparatus for mixing a polymer with water to provide a mixture having a selectable viscosity and for injecting the mixture into a well, comprising:

first pump means for flowing the water, said first pump means having an outlet from which the water flows;

first flow detector means for generating a first electrical signal proportional to the volumetric flow of the water, said first flow detector means having an inlet connected to

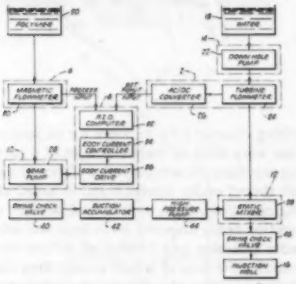
the outlet of the first pump means and also having an outlet;

second pump means for flowing the polymer, said second pump means having an inlet for receiving the polymer and also having an outlet for discharging the polymer;

second flow detector means for generating a second electrical signal proportional to the volumetric flow of the polymer, said second flow detector means having an outlet from which the polymer flows and to which the inlet of said second pump means is connected;

control means, responsive to said first electrical signal and said second electrical signal, for controlling said second pump means so that a selectable ratio between the volumetric flow of the water and the volumetric flow of the polymer is maintained, said control means including:

proportional integral and derivative computer means for generating an output signal in response to said first electrical signal and said second electrical signal;



eddy current controller means, responsive to said output signal from said proportional integral and derivative computer means, for providing an eddy current control signal; and

eddy current drive means, responsive to said eddy current control signal, for providing an eddy current drive signal;

mixer means for mixing the flow of the water with the controlled flow of the polymer, said mixer means having a first inlet associated with the outlet of said first flow detector means and also having a second inlet associated with the outlet of said second pump means and further having an outlet from which the mixture is injected into the well; and

said second pump means is responsive to said eddy current drive signal.

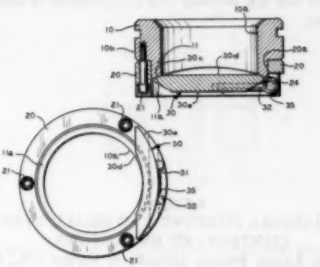
4,433,702

FULLY OPENING FLAPPER VALVE APPARATUS

John R. Baker, Houston, Tex., assignor to Baker International Corporation, Orange, Calif.

Filed Jul. 6, 1981, Ser. No. 280,039
Int. Cl.³ F16K *15/03*
U.S. Cl. 137—527.6 **2 Claims**

1. A flapper valve for incorporation within a tubular conduit of a subterranean well, comprising: an annular valve seat sleeve surrounding a fluid flow bore therethrough and having a fixed annular concave seating surface defined on said annular sleeve by the intersection of a cylindrical surface having an axis perpendicular to and passing through the axis of the flow bore and valve seat sleeve; valve head pivoting means having an axis exterior of said seating surface; a flapper valve head having the configuration of a circular section of a tubular wall, the axis of the circular section being perpendicular to the tubular wall, said tubular wall having inner and outer tubular surfaces having inner and outer tubular axes, respectively, each tubular axis being perpendicular to the axis through the flow bore of said seating surface when said valve head is manipulated to the closed position relative to the seating surface, the inner and outer tubular axes being parallel to said axis through the flow bore when said flapper valve head is manipulated to the open position relative to said seating surface; and convex sealing means positioned on said valve head between said inner



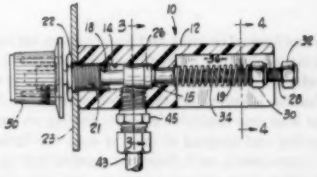
and outer tubular surfaces for sealing contact with said seating sruface when said valve head is in the closed position, said sealing means having an annular surface having substantially the same effective diameter as the effective diameter of the seating surface.

4,433,703

PANEL MOUNTED VACUUM CONTROL VALVE

Henry H. Jenkins, 864 W. Hacienda Dr., Corona, Calif. 91720

Filed Apr. 12, 1982, Ser. No. 367,160
Int. Cl.³ F16K *17/06, 15/18*
U.S. Cl. 137—541 **2 Claims**



2. A control valve including in combination a housing having first and second end portions,

a bore in said housing,

wall means in said second end portion of said housing defining a slot opening to the exterior of said housing with said slot being defined by first and second generally parallel sidewalls and a connecting wall,

a valve seat in said bore,

an actuating shaft having first and second end portions and extending in said bore,

a valve member movable into and out of contact with said valve seat to close and open said valve,

said valve member connected to said shaft for movement therewith,

said second end portion of said shaft having threads thereon in threaded engagement with an axially movable nut member and residing in said slot,

a spring member biasing said valve member to closed position,

said nut member having surfaces lying adjacent said first and second generally parallel sidewalls respectively and preventing rotation of said nut,

said first end portion of said actuating shaft extending outwardly of said first end portion of said housing, knob

means secured to said first end portion of said actuating shaft to enable an operator to rotate said shaft and to move said shaft axially against the urging of said spring member to open said valve member and connect said bore on said valve member side of said valve seat to atmosphere,

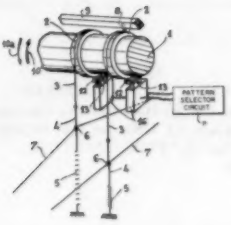
rotation of said shaft in a given direction causing axial movement of said nut member and compression of said spring member.

4,433,704

MECHANICAL CORDING AND HEALD SYSTEM CONTROLLED BY PULLEYS

Guy Decuq, Lyons, France, assignor to Verdol S.A., Caluire, France

Filed Oct. 13, 1981, Ser. No. 310,715
Claims priority, application France, Oct. 15, 1980, 80 22421
Int. Cl.³ D03C *1/12*
U.S. Cl. 139—66 R **8 Claims**



1. In a mechanical cording and heald system for looms of the type having a plurality of heddle-raising units controlled by pattern selector means and supported by a common shaft, each unit including a pulley on the outer periphery of which is wound at least one funicular member having an end attached to said pulley and adapted to raise at least one heddle against suitable return means, each funicular member having a low and a high position, stop means to limit the rotation of said pulley under the action of said return means when said funicular member has reached its low position, and means to selectively connect said pulley with driving means rotating alternately in one or the other direction in synchronism with the operative cycle of the loom through an angle of less than 360° to cause said funicular member to move between its low and high positions, each unit comprising:

(a) in said driving means first and second axially juxtaposed annular driving members mounted on the shaft;

(b) means to impart to said driving members oppositely directed angular movements of the same amplitude in synchronism with said loom cycle, whereby at the end of each operative cycle of said loom each of said driving members has completed its rotation, one member being in a first position in which a pulley coupled thereto will reach the end of its stroke by winding the funicular member thereon, and the other member being in a second position in which a pulley coupled thereto will reach the end of its stroke by unwinding the funicular member therefrom; and

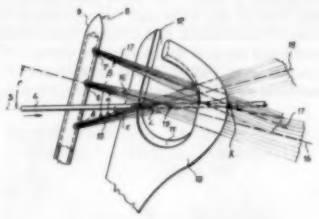
(c) coupling means under the control of said pattern selector means and operative at the beginning of a loom cycle to selectively connect said pulley with the one of said driving means which is at said second position.

4,433,705

PICKING CHANNEL FOR A JET LOOM

Miloslav Cech, Brno; Vladimir Kuda, Blazovice, and Vladimir Vasicek, Moravsky Krumlov, all of Czechoslovakia, assignors to Vyzkumny a vyvojovy ustav Zavodu vseobecneho strojirenstvi, Brno, Czechoslovakia

Filed Sep. 25, 1980, Ser. No. 190,730
Claims priority, application Czechoslovakia, Oct. 3, 1979, 6677-79
Int. Cl.³ D03D *47/30*
U.S. Cl. 139—435 **9 Claims**



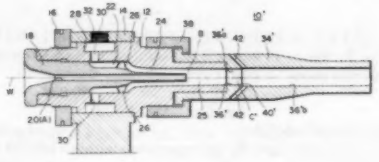
1. A picking channel for a jet loom for picking a weft thread through the warp shed by means of a jet of a carrier medium, comprising auxiliary blowing nozzles disposed along the path of the weft thread under insertion and directed obliquely into the picking direction of the weft thread, at least one auxiliary blowing section being disposed on at least one side of the weft thread under insertion and formed of at least three auxiliary blowing nozzles the axes of which constituting skew lines, the axis of the first auxiliary blowing nozzle intersecting the axis of the weft thread under insertion, and the axes of the other auxiliary blowing nozzles of the auxiliary blowing section passing the axis of the weft thread under insertion on the outside in the direction of the axis of the first auxiliary blowing nozzle.

4,433,706

WEFT INSERTING NOZZLE OF AN AIR JET TYPE WEAVING LOOM

Takao Takahashi; Kimimasa Ohnishi, and Sinzi Wakai, all of Tokyo, Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Sep. 28, 1981, Ser. No. 306,299
Claims priority, application Japan, Oct. 15, 1980, 55-142927
Int. Cl.³ D03D *47/30*
U.S. Cl. 139—435 **1 Claim**



1. A weft inserting nozzle for an air jet type weaving loom, comprising:

a weft inserting body having therein a weft inserting first hole through which a weft yarn is adapted to pass, and an exit portion;

a hollow body having a bore coaxially disposed about said weft inserting body to define around said exit portion an annular air jet opening from which pressurized air is ejected downstream for drawing the weft yarn out of said weft inserting body;

a tubular body coaxially aligned with and connected to the bore in said hollow body to define a coaxial weft inserting

second hole extending downstream from said annular air jet opening, said second hole having an upstream first section and a downstream second section, each of said sections having a uniform diameter throughout its length, the diameter of said second section being greater than that of said first section so that a stepped portion is defined between said first and second sections;

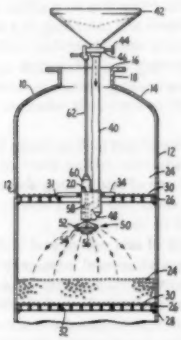
said tubular body having a plurality of air holes extending therethrough and connecting said second section to a source of air, each of said plurality of air holes extending from said stepped portion radially outwardly and obliquely in an upstream direction.

4,433,707

METHOD AND APPARATUS FOR LEVEL LOADING OF VESSELS USING CATALYST ORIENTED PACKING

Robert A. Farnham, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Sep. 25, 1981, Ser. No. 305,696
Int. Cl.³ B65B *1/04*
U.S. Cl. 141—1 **12 Claims**



1. Method of uniformly filling a large diameter catalytic reactor vessel with solid catalyst particles to avoid classification of larger particles and fines at different levels in said vessel which comprises:

providing a gravity flow of said catalyst particles from a first hopper located above said vessel to a second hopper having an outlet located within said vessel and forming a cylindrical flow of said catalyst particles at the outlet of said second hopper near the center of said reactor vessel,

dividing the cylindrical flow into an outer annular portion and an inner cylindrical portion,

selectively deflecting the outer annular portion of said cylindrical flow radially outwardly at a first velocity sufficient so that said particles will reach the sidewall of said reactor vessel, and then, deflecting the inner cylindrical portion of said cylindrical flow radially outwardly at a lower velocity so that said particles will reach a portion of said vessel intermediate the center thereof and said sidewall.

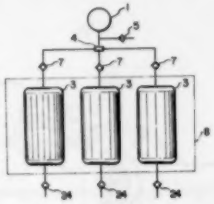
4,433,708

AIR BAG SYSTEM

Nobuyuki Hashimoto, Toyota, and Takemi Hattori, Kariya, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Dec. 29, 1981, Ser. No. 335,456
Claims priority, application Japan, Jan. 10, 1981, 56-1309[U]
Int. Cl.³ B65B *3/04*
U.S. Cl. 141—114 **2 Claims**

1. An air bag system, comprising a plurality of air bags, a pump for supplying each of said air bags with air through a respective pipe, dual function valves for operating as both a check valve and a stop valve, one of said dual function valves being arranged in each of the pipes communicating said pump with a respective one of the air bags, a relief valve for discharging air from each of the air bags, each of said dual function valves including a poppet valve biased by a spring and arranged in a chamber communicating with the respective air



bag, the poppet valve acting as a check valve for the respective air bag to prevent outflow of air therefrom and being manually operable to act as a stop valve for opening and closing communication between the pump and the respective air bag for selectively inflating the respective air bag such that the plurality of air bags may be inflated individually.

4,433,709

DRYWALL HATCHET

Lawrence W. Porter, Ringwood, Ill., assignor to Vaughan & Bushnell Manufacturing Co., Hebron, Ill.

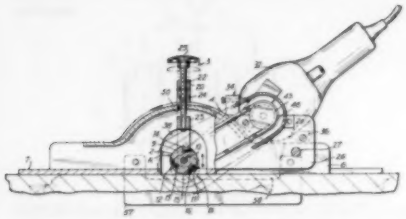
Filed Mar. 29, 1982, Ser. No. 362,912
Int. Cl.³ B26B *23/00*
U.S. Cl. 145—2 R **7 Claims**

1. In a head unit for a drywall striking tool including a medial body portion, a hammerhead portion projecting longitudinally forwardly from the body portion, and a blade portion projecting longitudinally rearwardly from the body portion, the improvement wherein said hammerhead portion comprises a transversely extending truncated disk-like portion bounded by a substantially planar top marginal surface extending transversely between opposite ends thereof, and an arcuate side and bottom marginal surface extending substantially circularly around the disk-like portion from one of said ends of the top marginal surface to the opposite end thereof, said side and bottom marginal surface being convexly curved in the longitudinal direction of the head unit, said disk-like portion having a forwardly facing convexly curved striking surface extending between said marginal surfaces, said striking surface including a convexly curved central milled area having a plurality of serrations therein, and a substantially smooth convexly curved border of continuous curvature with said milled area, and said border extending from said milled area to said marginal surfaces completely around said striking surface, said striking surface thereby being free of prominent serrations.

4,433,710
POWER PLANING TOOL

Antonio D. Posta, 1097 Boston Post Rd., Rye, N.Y. 10580

Filed Oct. 28, 1981, Ser. No. 315,966
Int. Cl.³ B27C 1/10
U.S. Cl. 145—4 11 Claims



1. A plane, adapted to cut a hinge recess in a door edge, comprising

a housing having a base having a cutout therethrough, the cutout being dimensioned so that it begins at a first edge of the base, extends axially across the base and ends short of a second edge of the base opposite the first edge, the cutout being substantially U-shaped;

a rotary cutter mounted for rotation relative to the base, the cutter being mounted from the housing and in alignment with the cutout;

means, mounted from the housing, for selectively adjusting the position of the cutter relative to the base so that when the cutter is at a first position the cutter extends through the cutout to a point below the bottom plane of the base and can contact and cut an underlying door edge, and when the cutter is at a second position the cutter does not extend through the cutout to a point below the bottom plane of the base and cannot contact and cut an underlying door edge;

limiting means, mounted from the housing, for preventing the cutter from cutting across the entire width of an underlying door edge when the cutter is at the first position and in cutting contact with an underlying door edge so that an uncut strip of door edge is left after a hinge recess is cut therein by the plane, the uncut strip serving to limit lateral movement of a door hinge mounted in the hinge recess;

means, mounted from the housing, for rotating the cutter, the means for rotating comprising a first pulley on the cutter, a second pulley, mounted from the housing, a tensioned drive belt engaging the first pulley and the second pulley and means for driving the second pulley;

means, mounted from the housing, for maintaining the position of the first pulley and the second pulley, relative to one another, substantially constant when the position of the cutter is adjusted so that substantially constant tension on the drive belt is maintained; and

means, mounted from the housing, for limiting travel of the plane along the underlying door edge, said means for limiting travel comprising a guide mounted from the housing adjacent the second edge, the guide extending below the bottom plane of the base and being substantially perpendicular to the base, the guide having a cutout, the cutout in the guide and the second edge of the base forming there between a longitudinal slot closed at its ends,

a guide pin removable positionable in the slot,

and means, removably attachable to a door, for fixing the guide pin at a desired limiting position on the door whereby when the guide pin is in the slot and the plane is moved along the door edge travel of the plane will be halted when the end of the slot contacts the guide pin within the slot.

4,433,711
COIL CURTAIN

Hyok S. Lew, 7890 Oak St., Arvada, Colo. 80005

Filed Mar. 14, 1979, Ser. No. 20,495
Int. Cl.³ A47H 1/00
U.S. Cl. 160—120 10 Claims

1. A coil curtain retracting to a series of rolls adjoining to each other when open and extending to a sheet reinforced with a series of uniformly spaced residual rolls when closed, said coil curtain comprising in combination

(a) one or more coiling sheets, said coiling sheets rolling itself into one or two coils when an external restraint is absent;

(b) one end of one of said coiling sheets is spliced to the other end of first adjacent coiling sheet of said coiling sheets, wherein said one of said coiling sheets and said first adjacent coiling sheet roll into a coil in the same direction superimposed to each other;

(c) the other end of said one of said coiling sheets is spliced to the one end of second adjacent coiling sheet of said coiling sheets, wherein said one of said coiling sheets and said second adjacent coiling sheet roll into a coil in the same direction superimposed to each other; whereby, one half of said one of said coiling sheets and the other half of said first adjacent coiling sheet roll into one coil, and the other half of said one of said coiling sheets and the one half of said second adjacent coiling sheet roll into the other coil.

4,433,712
INSULATING DEVICE FOR IMPEDING HEAT FLOW

Timothy Mellon, Guilford, and Gustaf B. Carlson, Haddam, both of Conn., assignors to Independent Systems Corporation, Durham, Conn.

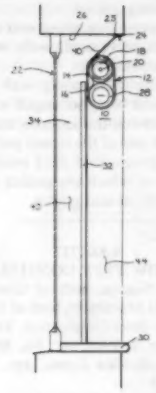
Filed Dec. 11, 1980, Ser. No. 215,427
Int. Cl.³ A47H 1/00
U.S. Cl. 160—122 18 Claims

1. Apparatus for reducing the amount of heat introduced into or leaving a space through a barrier comprising:

a support member secured to the barrier; and

a flexible sheet adjoining the space and formed of a material having a low heat-emitting surface fixed at one edge to said support and at a second edge to a mounting at a location spaced from the location at which said one edge is fixed to said support, said sheet adapted to cooperate with the barrier and said support to create an air-filled chamber that prevents the flow of air to or from the space

and to or from the interior of said chamber through the barrier, that retards heat flow by conduction to or from



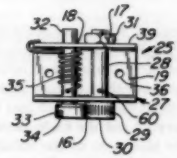
the space through the barrier, and that blocks the path of radiant energy directed at the space through the barrier.

4,433,713

BLIND

Larry L. Kelly, 3295 Bridle Dr., Hayward, Calif. 94541

Filed Jul. 19, 1982, Ser. No. 399,634
Int. Cl.³ E06B *9/26, 9/38;* F16D *63/00*
U.S. Cl. 160—166 R **5 Claims**



1. In a blind having a plurality of parallel salts, and including a headrail at one end and a baserail at the other end, a device for maintaining said slats in coplanar alignment with regard to blind orientation, comprising:

a guy wire extending along said blind's length and perpendicular to said slats and guiding said slats into coplanar alignment, wherein said guy wire is secured to and extended along said blind's length between said headrail and said baserail; and

ratchet means for adjusting said guy wires tautness, including:

(a) an elongated spindle for spooling said guy wire, said spindle having an enlarged cylindrical head portion including a plurality of parallel, spaced notches extending axially along a head outer surface; and

(b) an elongated shaft parallel to said spindle and having an enlarged eccentric head portion including an axially extending protuberance for engagement with said spindle's spaced notches, said engagement being unyielding in a guy wire unspooling direction of spindle rotation and said engagement being yielding in a guy wire spooling direction of spindle rotation.

4,433,714

ROLLER SHUTTER DOORS

Arthur B. Barber, 111 Albert St., Strathfield, Sydney, New South Wales, Australia

Filed Oct. 23, 1981, Ser. No. 314,110
Int. Cl.³ E06B *3/12*
U.S. Cl. 160—235 **5 Claims**

1. A method of assembling elongated slats to form a shutter, said method comprising the steps of providing a plurality of elongated slats each with a front face and a back face and an open edge curl along both long edges of each slat with one curl directed towards the front slat face and the other being a rearward curl directed towards the back face of the slat, the curls being complementarily shaped to co-act with respective ones of the curls of adjacent interengaged slats, providing a length of resilient material larger in normal cross-section than the area defined by the inner surfaces of the curls of two interengaged curls, inserting the entire length of said resilient material in the curl of a first slat, applying a longitudinal force to the length of resilient material to cause its cross-sectional dimension throughout its length to be uniformly reduced to less than the cross-sectional area defined by the inner surfaces of the curls of two interengaged slats, inserting a complementary curl of a second slat into the curl of the first slat in which the length of resilient material is disposed with the length of resilient material between the inner surfaces of the interengaged curls of the slats, and releasing the longitudinal force from the length of resilient material allowing it to recover to a cross-sectional shape and size determined by the space between the inner surfaces of the interconnected curls.

4,433,715

MODULAR APPARATUS FOR CASTING METAL STRIP

Robert W. Smith, Long Valley, N.J., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Continuation-in-part of Ser. No. 152,208, May 21, 1980, abandoned. This application Apr. 9, 1982, Ser. No. 366,941
Int. Cl.³ B22D *11/00*
U.S. Cl. 164—423 **4 Claims**

1. A modular apparatus for casting molten metal onto a movable chill surface to form continuous strip, which comprises in combination:

(a) a crucible for holding the molten metal comprising

(1) a receptacle having two open ends and

(2) a separate base in sealing engagement with a first end of the receptacle and having a through passage,

(b) a cap member in sealing engagement with the second end of the receptacle.

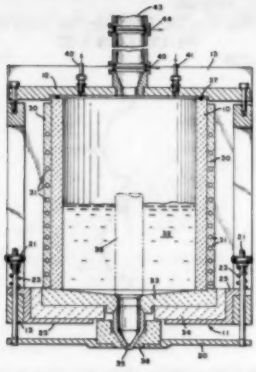
(c) heating means for maintaining the metal in the molten state in the receptacle, and

(d) a nozzle having one end in sealing engagement with the base and providing, in communication with the through passage, a conduit for passing molten metal from the crucible into contact with the chill surface,

(e) means for stopping molten metal flow out of the crucible with or without the nozzle in place,

(f) crucible support means attached to the cap member and supporting the separate base, and

(g) resilient nozzle support means for supporting the other end of the nozzle and for providing controlled loading



forces for the sealing engagements at the seals at the ends of the receptacle, and between said one end of the nozzle and the through passage of the base.

4,433,716

ROLLER APRON FOR THE WITHDRAWAL AND/OR STRAIGHTENING REGION OF A CONTINUOUS CASTING INSTALLATION FOR STRANDS

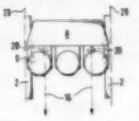
Hans Streubel, Erkrath, Fed. Rep. of Germany, assignor to SMS Schloemann-Siemag Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

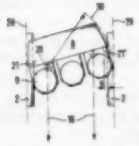
Filed Feb. 3, 1982, Ser. No. 345,542

Claims priority, application Fed. Rep. of Germany, Feb. 21, 1981, 3106531

Int. Cl.³ B22D *11/128*

U.S. Cl. 164—448 **6 Claims**





1. A roller apron for a withdrawal and/or straightening region of a continuous casting installation for the continuous casting of strands moving along a strand path of travel, comprising:

two roll tracks subdivided into sections along partition lines extending transversely relative to said two roll tracks;

each section of each roll track containing at least two rolls;

a respective traverse at which there are mounted the rolls in each section of each one of said two roll tracks;

frame means;

stationary arranged pressurized fluid medium cylinders containing piston rod heads;

one of the traverses in each said section of one of said two roll tracks being affixed to said frame means and the other traverse in each said section of the other one of said two roll tracks defining a movable traverse which is hingedly connected at said piston rod heads of said stationarily arranged pressurized fluid medium cylinders;

stand means containing guides;

said partition lines extending along said stand means;

the piston rod heads being operatively associated with said guides of said stand means;

said guides extending transversely with respect to the related roll track and being arranged at the region of the partition lines between the sections; and

each section at each side of the strand path of travel containing two of said pressurized fluid medium cylinders, the piston rod heads of which are guided at one side thereof along a related one of said guides.

4,433,717

PROCESS FOR BOW TYPE CONTINUOUS CASTING

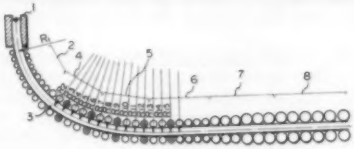
Yasuo Suzuki; Shuji Nagata, both of Kitakyushu; Takashiro Nonaka, and Tadashi Murakami, both of Himeji, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Apr. 2, 1981, Ser. No. 250,303

Claims priority, application Japan, Apr. 2, 1980, 55-43380; Apr. 2, 1980, 55-43382

Int. Cl.³ B22D *11/16*

U.S. Cl. 164—454 **11 Claims**



1. A bow type continuous casting process using a curved mold, comprising:

continuously casting molten steel into the curved mold to obtain a curved strand having a thickness of not less than 200 mm;

subjecting the curved strand to multi-point straightening, initiating the straightening at a region of the strand where the thickness of the solidified shell of the strand is at least 20 mm and not more than 60 mm; and

controlling the speed of the strand and the cooling conditions while carrying out the multi-point straightening for maintaining the thickness of the solidified shell from at least 20 mm to not more than 60 mm until completion of said straightening.

4,433,718

THERMOSTATICALLY-REGULATED ARRANGEMENT FOR AND METHOD OF SWITCHING POWER TO A HEATING/COOLING SYSTEM, AND METHODS OF INSTALLING AND RETROFITTING THE ARRANGEMENT AT AN ELECTRICAL OUTLET BOX

Elias H. Bresin, 1020 Northern Blvd., Baldwin Harbor, N.Y. 11510, assignor to Elias H. Bresin, Baldwin Harbor and David Sanders, New York, both of, N.Y., a part interest

Filed Jun. 21, 1982, Ser. No. 390,761

Int. Cl.³ F23N *5/20*

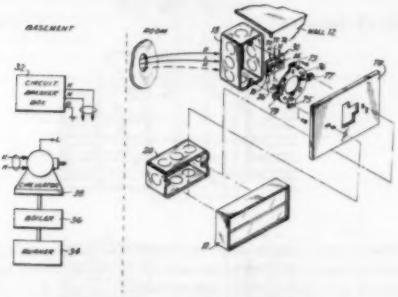
U.S. Cl. 165—12 **23 Claims**

1. A compact temperature-regulated power control arrangement for switching an electrical power source at a rated line voltage to a heating/cooling system load, comprising:

(a) low voltage-operated thermostat means mounted at and in front of an electrical outlet box in a room whose temperature is to be regulated, and being settable at any desired predetermined time and temperature characteristic, said thermostat means being operative for sensing the room temperature, and having a low voltage-operated

thermostat switch switchable at a low voltage below the line voltage between a heat-off condition in which a heat-off signal is generated when the sensed temperature is above a set temperature, and a heat-on condition in which a low voltage heat-on signal is generated when the sensed temperature is below the set temperature;

(b) compact transformer means operatively connected between the power source and the thermostat means, for converting the line voltage to the low transformer voltage required to operate the thermostat switch;



(c) compact control means operatively connected between the thermostat means and the load, for conducting power to the load in the heat-on condition, and for interrupting power to the load in the heat-off condition; and

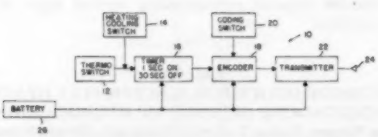
(d) means for mounting the compact transformer means and the compact control means rearwardly of the thermostat means and within the electrical outlet box, to simplify the retrofit replacement of a conventional line voltage-operated thermostat with a low voltage-operated thermostat.

4,433,719

PORTABLE, REMOTE ENVIRONMENTAL CONTROL SYSTEM

Raymond L. Cherry, King County, Wash.; Gene F. Pfeiffer, Lewis and Clark County, Mont., and Randell P. Maes, King County, Wash., assignors to TASA Products Limited, Seattle, Wash.

Filed Mar. 11, 1982, Ser. No. 357,293
Int. Cl.³ G05D *23/00*
U.S. Cl. 165—26 **19 Claims**



1. A system for operating an environmental control unit which regulates an environmental condition at a remote location, comprising:

a transmitter unit placed at said remote location, said unit including:

(1) environmental-sensing means for sensing the value of said environmental condition;

(2) comparator means for comparing the value of said environmental condition to a preset value and for producing an actuating signal responsive to a predetermined difference therebetween;

(3) a radio transmitter actuated by said actuating signal, thereby generating an RF signal in accordance with said environmental condition; and

a receiver unit connected to said environmental control unit, said receiver unit generating an output which energizes said environmental control unit responsive to receipt of said RF signal, said environmental control unit being actuated by placing a relatively low impedance between a pair of terminals across which an AC signal is present and wherein said receiver unit includes a circuit for selectively applying a low impedance between said terminals responsive to the receipt of said RF signal while applying power to said receiver unit from the AC signal across said terminals, said circuit comprising:

an energy storage device applying electrical power to said receiver unit while discharging and storing energy while charging;

a rectifier connected to said energy storage device, said rectifier charging said energy storage device with DC power upon receipt of said AC signal while disconnecting said energy storage device when the magnitude of said AC voltage is less than the voltage from said energy storage device;

a first normally open switch selectively being closed to apply said AC signal to said receiver;

a second normally open switch connected across said terminals, said switch being selectively closed to place a low impedance between said terminals; and

control means effective upon receipt of said RF signal by said receiver to close said first switch and open said second switch during a predetermined portion of each AC cycle and to close said second switch during the remainder of said AC cycle, said predetermined portion constituting a relatively small portion of said AC cycle so that the average impedance between said terminals is relatively low.

4,433,720

EARTH TEMPERED BUILDING DESIGN SYSTEM

W. Robert Lowstuter, 8718 Orient Way, NE., St. Petersburg, Fla. 33702

Filed Apr. 24, 1981, Ser. No. 257,191
Int. Cl.² E02D *27/32*
U.S. Cl. 52—169.11 **16 Claims**

1. A thermal interceptor for building climate modification, wherein a building wall defines a segment of an enclosure, the interceptor comprising:

at least one thermal conductor extending at least partially along the height of the wall;

said thermal conductor having a thermal conductivity greater than the wall;

said thermal conductor being in thermal contact with the wall;

at least one thermal probe extending into the earth adjacent the building wall to a depth wherein the earth exhibits a substantially constant temperature for the location of the building; and

means for directly connecting said thermal conductor to said thermal probe enabling the natural flow of heat between said thermal conductor and said thermal probe to maintain the

temperature of the building commensurate with said substantially constant temperature.

4,433,721

SPACER GRID FOR SUPPORTING ROD-SHAPED MEMBERS

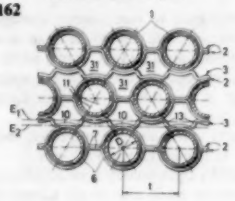
Armando Biaggi, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Aug. 3, 1981, Ser. No. 289,240

Claims priority, application Switzerland, Aug. 6, 1980, 5945/80

Int. Cl.³ F28F 9/00

U.S. Cl. 165—162 **8 Claims**



1. A spacer grid for supporting a plurality of parallel rod-shaped members, said grid comprising

pairs of guide strips disposed in abutting relation to support a respective row of rod-shaped member, each said guide strip having alternating substantially semi-cylindrical portions and flat portions with each semi-cylindrical portion of one strip disposed opposite a respective semi-cylindrical portion of the other strip to define a circular opening to receive a rod-shaped member; and

a plurality of spacer strips, each said spacer strip being disposed in parallel relation to and between two adjacent pairs of guide strips, each said spacer strip having alternating bent portions and rectilinear portions with each bent portion bearing against a respective seim-cylindrical portion of an adjacent guide strip.

4,433,722

HEAT EXCHANGER HAVING PIPE COILS SUPPORTED IN SUPPORT PLATES

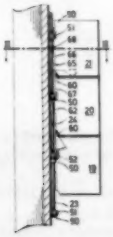
Alfred Fueglister, Winterthur, CH-8400 Switzerland, assignor to Sulyer Brothers Limited, Winterthur, Switzerland

Filed Sep. 15, 1981, Ser. No. 302,664

Claims priority, application Switzerland, Sep. 17, 1980, 6958/80

Int. Cl.³ F28D 7/00

U.S. Cl. 165—162 **10 Claims**



1. A heat exchanger comprising

a pipe;

a plurality of support plates extending radially of said pipe and having a plurality of bores therein;

a plurality of pipe coils passing through said bores of said plates, and

a thin-walled sleeve disposed about said pipe in spaced relation thereto, one end of said sleeve being secured to said pipe and an opposite end of said sleeve being secured to said support plates to resiliently mount said support plates relative to said pipe.

4,433,723

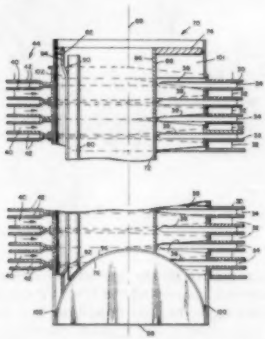
HEAT EXCHANGER METHOD AND APPARATUS

Kenneth O. Parker, Rolling Hills Estates, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

Division of Ser. No. 725,613, Sep. 22, 1976, abandoned. This application Jul. 7, 1978, Ser. No. 922,624

Int. Cl.³ F28F 3/00

U.S. Cl. 165—166 **1 Claim**



1. In combination, a heat exchanger of the counterflow type with formed tube air outlet manifolds having openings communicating with air passages of the heat exchanger core, and air outlet manifold inserts, said inserts each comprising:

a segmented cylindrical tube having apertures longitudinally spaced, aligned, and elongated in the cylindrical portion opposite from said air passages:

means carried by said tubular member and in cooperation with a manifold to define a chamber within the manifold surrounding said tubular member, said means comprising

a plate having an opening accommodating one end of said segmented cylindrical tube and secured thereto and

a hemispherical plate secured to the other end of said segmented cylindrical tube; and

a pair of cylindrical members longitudinally positioned within said segmented cylindrical tube, each of said cylindrical members being secured to said cylindrical tube adjacent opposed corresponding vertical edges of the apertures.

4,433,724

ELECTRODE DEVICE FOR ELECTRICALLY HEATING UNDERGROUND DEPOSITS OF HYDROCARBONS

Toshio Nagano, Osaka; Toshiyuki Kobayashi, Hyogo; Nobutaka Koshirakawa, Hyogo, and Takeo Inoue, Hyogo, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 2, 1981, Ser. No. 250,379

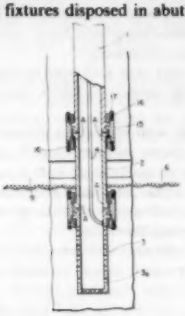
Claims priority, application Japan, Apr. 14, 1980, 55-51127

Int. Cl.³ E21B 36/04

U.S. Cl. 166—60 **4 Claims**

1. In an oil well construction in which an insulated pipe of porcelain is interposed between and has one end contacting a main guide pipe and a second end contacting an electrode thereby to insulatingly connect the guide pipe and electrode and in which an electric current is coupled to said electrode, an electrode device for electrically heating underground deposits of hydrocarbons comprising an insulated pipe having a body portion of a first diameter, an end portion of a second diameter greater than said first diameter, and an outer circumferential

portion between said body portion and said end portion, said outer circumferential portion being formed with counter-tapered surfaces which diverge at a predetermined angle away from said body portion and toward said end portion; shock absorbers; fastening fixtures disposed in abutting engagement



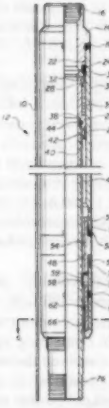
with said counter-tapered surfaces through said shock absorbers; said shock absorbers disposed annularly about said insulating pipe and disposed between the end portion of a second diameter and said fastening fixtures; and means for coupling said fastening fixtures to connectors which are coupled to said main guide pipe and said electrode.

4,433,725

ADJUSTABLE SPACER WITH ROTATIONAL LOCK

Michael L. Bowyer, Aberdeen, Scotland, assignor to Baker International Corporation, Orange, Calif.

Filed Oct. 2, 1981, Ser. No. 307,908
Int. Cl.³ E21B *17/07*
U.S. Cl. 166—65 R **1 Claim**



1. A pumping assembly for use within the casing of a subterranean well, comprising:

an electric submersible pump attached to a lower tubular member;

anchoring means affixing an upper tubular member to said casing;

an electrical cable attached to said electric submersible pump and to said anchoring means;

inner and outer telescoping members between said electric submersible pump and said anchoring means, said telescoping members permitting relative longitudinal movemnt between said anchoring means and said electric submersible pump;

means for preventing rotation between said inner and outer telescoping members upon relative longitudinal movement therebetween;

first threaded elements extending along the exterior of said inner telescoping member;

at least one segment relatively longitudinally fixed to said outer telescoping member and having second threaded elements on the interior thereof for engaging said first threaded elements; and

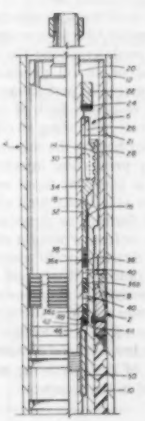
a longitudinally movable cylindrical sleeve threadably engaging the outer tubular member for movement from a first to a second position and having a stepped inner surface retaining said segment in a radially inward position in threaded engagement with said first threaded elements in said first position, threaded disengagement of said cylindrical sleeve to said second position allowing said segment to expand radially outward to ratchet relative to said first threaded elements during longitudinal movement between said inner and outer telescoping members whereby the spacing between said anchoring means and said electric submersible pump removes slack from said electrical cable extending therebetween, and rotational movement of said cylindrical sleeve to said first position prevents further telescoping movement between said telescoping members.

4,433,726

ENERGIZED PACKER ANCHOR SEAL ASSEMBLY

Dan C. Preston, Jr., Whittier, and Yung J. Kim, Hacienda Heights, both of Calif., assignors to Baker Oil Tools, Inc., Orange, Calif.

Filed Feb. 18, 1982, Ser. No. 349,783
Int. Cl.³ E21B *33/12*
U.S. Cl. 166—118 **11 Claims**



1. A tubing anchor seal assembly for use in inserting a tubing string into secured sealing engagement in the bore of a cylindrical tool anchored in a subterranean well comprising: a mandrel having means for incorporating said assembly in said tubing string; a radially expandable latch engageable with said tool and having means for securing said anchor seal assembly in a first position against upward movement; shoulder means extending radially outward from said mandrel for abutting a surface on said tool in a second position to prevent further downward movement of said anchor seal assembly, said mandrel being longitudinally shiftable relative to said latch between said first and second positions, when said latch is engaged; an annular sealing means disposed around said mandrel and longitudinally shiftable relative thereto for establishing

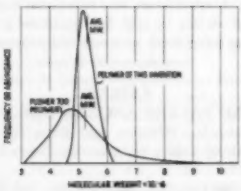
sealing integrity between said mandrel and the inner bore of said cylindrical tool and located between said latch and said shoulder means; concentric means on the exterior of said mandrel extending between said seal means and said latch and abutting said latch upon upward movement of said mandrel; and protruding means on said mandrel above and below said seal means; whereby upon upward movement of said mandrel said seal means are longitudinally compressed between the lower protruding means and said concentric means abutting said latch, and upon downward movement of said mandrel, the upper protruding means engages said concentric means to longitudinally compress said seal means, so that said seal means are energized by movement of said mandrel in either direction.

4,433,727

OIL RECOVERY PROCESS

Perry A. Argabright, Larkspur, and John S. Rhudy, Littleton, both of Colo., assignors to Marathon Oil Company, Findlay, Ohio

Filed Jun. 19, 1981, Ser. No. 275,594
Int. Cl.³ E21B *43/22*
U.S. Cl. 166—252 **9 Claims**



1. A process for recovering oil from a subterranean oil-bearing reservoir having located thereat at least one input well and at least one output well through which the oil in the reservoir is recovered in response to the force applied by a displacement fluid; comprising: predetermining the injectivity and mobility properties required of an oil displacement emulsion and a mobility buffer to meet the performance demands of a subterranean oil bearing reservoir both at an input well and in the matrix of the reservoir; providing an oil displacement emulsion and a mobility buffer having the required predetermined injectivity and mobility properties; injecting the emulsion into a reservoir through at least one input well formed in the reservoir; injecting into said input well the mobility buffer, said buffer being in the form of an aqueous solution of a polymer having an average molecular weight of about 10 million, and a molecular weight distribution of about 0.02 to about 0.22 as determined by the ratio $\sigma/\bar{M}$ wherein σ is the standard deviation of molecular weight of abundance of a molecular species present in the polymer and $\bar{M}$ is the average molecular weight of the polymer, the reciprocal relative mobility of said buffer being such that it is lower at and adjacent to the input well than it is in the matrix of the reservoir; and recovering oil at an output well formed in the reservoir.

4,433,728

PROCESS FOR SELECTIVELY REDUCING THE FLUID INJECTION RATE OR PRODUCTION RATE OF A WELL

Robert D. Sydansk, Littleton, Colo., and Paul R. Gucwa, Green Brae, Calif., assignors to Marathon Oil Company, Findlay, Ohio

Continuation-in-part of Ser. No. 164,619, Jun. 30, 1980, Pat. No. 4,287,951. This application Aug. 25, 1981, Ser. No. 295,962
The portion of the term of this patent subsequent to Sep. 8, 1998, has been disclaimed.
Int. Cl.³ E21B *33/138, 43/22*
U.S. Cl. 166—270 **9 Claims**

1. A process for improving areal conformance of fluids injected into or produced from a subterranean sandstone formation via a multiwell system, the multiwell system having at least one well wherein appreciably greater amounts of fluid than required to result in or maintain a substantially uniform flood front are injected into or produced from the at least one well than other wells of the multiwell system, the at least one well having a well bore penetrating and in fluid communication with the formation which has a near well bore environment, the process comprising:

injecting into said near well bore environment via said well bore a caustic aqueous solution, having caustic dissolved therein;

shutting in said well bore for a period of time sufficient to allow said caustic to interact with said sandstone formation thereby resulting in at least a portion of said caustic being held within said near well bore environment;

injection into said near well bore environment an aqueous spacer slug; and thereafter,

injection into said near well bore environment via said well-bore a polyvalent cation containing solution having a polyvalent cation dissolved therein that is reactive with said caustic, permitting said polyvalent cation to react with said at least a portion of said caustic to form an insoluble precipitate in said near well bore environment of the formation over substantially the entire well bore interval, said precipitate reducing the permeability of said near well bore environment over substantially the entire well bore interval.

4,433,729

PROCESS FOR SELECTIVELY REDUCING THE FLUID INJECTION RATE OR PRODUCTION RATE OF A WELL

Robert D. Sydansk, Littleton, Colo., assignor to Marathon Oil Company, Findlay, Ohio

Continuation-in-part of Ser. No. 164,618, Jun. 30, 1980, Pat. No. 4,304,301. This application Sep. 8, 1981, Ser. No. 299,918
The portion of the term of this patent subsequent to Dec. 8, 1998, has been disclaimed.
Int. Cl.³ E21B *33/138, 43/22*
U.S. Cl. 166—270 **9 Claims**

1. A process for improving areal conformance of fluids injected into or produced from a subterranean formation via a multiwell system, the multiwell system having at least one well wherein appreciably greater amounts of fluid than required to result in or maintain a uniform flood front are injected into or produced from the at least one well than other wells of the multiwell system, the at least one well having a well bore penetrating and in fluid communication with the formation which has a near well bore environment, the process comprising:

injecting into said near well bore environment via said well bore a caustic aqueous solution;

injecting into said near bore environment via said well bore a polyvalent cation containing aqueous solution having a polyvalent cation dissolved therein, said polyvalent cation reacting with said caustic when said caustic aqueous solution mixes with said polyvalent cation containing aqueous solution to form an insoluble precipitate over substantially the entire well bore interval in said near well bore environment of the formation; and

injecting into said near well bore environment via said well bore a hydrocarbon spacer between said caustic aqueous solution and said polyvalent cation containing aqueous solution, said hydrocarbon spacer causing delayed mixing of said solutions until said solutions are in said near well bore environment and said mixing resulting in formation of said insoluble precipitate which reduces the permeability of said near well bore environment over substantially the entire well bore interval.

4,433,730

OPTIMUM GRADING OF CHEMICAL CONCENTRATIONS IN A MICELLAR FLOOD

Scott P. Trushenski, Salt Lake City, Utah, assignor to Standard Oil Company, Chicago, Ill.

Filed Mar. 30, 1981, Ser. No. 248,739
Int. Cl.³ E21B *43/22*
U.S. Cl. 166—274 12 Claims

1. In a method for displacing oil through an oil bearing formation penetrated by injection and producing wells, the improvement comprising: (a) injecting an aqueous micellar fluid bank into the formation through the injection well, and (b) injecting a mobility control fluid bank into the formation through the injection well to displace the oil to the producing wells, whereby the composition of the micellar and mobility control fluid banks are graded such that the leading edge of the micellar bank is miscible with oil and the rear portion of the mobility control fluid bank is miscible with water.

4,433,731

LIQUID WATER LOSS REDUCING ADDITIVES FOR CEMENT SLURRIES

Jiten Chatterji; Bobby G. Brake, and John M. Tinsley, all of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Continuation of Ser. No. 301,560, Sep. 14, 1981, abandoned. This application Mar. 30, 1983, Ser. No. 480,087
Int. Cl.³ E21B *33/138, 33/14*
U.S. Cl. 166—293 8 Claims

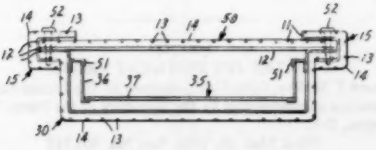
3. A method of reducing the water loss from a cement slurry formed using sea water and used for cementing a well comprising the step of mixing a liquid water loss reducing additive with the sea water used to form the cement slurry, said liquid water loss reducing additive consisting of an aqueous solution of carboxymethylhydroxyethylcellulose having a carboxymethyl D.S. in the range of from about 0.1 to about 0.7 and an ethylene oxide M.S. in the range of from about 0.7 to about 2.5 and having a molecular weight such that a 5% by weight aqueous solution of said carboxymethylhydroxyethylcellulose at a temperature of 78° F. has a viscosity in the range of from about 75 to about 300 centipoises measured on a Brookfield viscometer at 60 rpm using a No. 4 spindle and a base selected from the group consisting of sodium hydroxide and potassium hydroxide said base being present in said additive in an amount in the range of from about 2% to about 5% by weight of said additive.

4,433,732

CABLE TRAY PROTECTION SYSTEM

Richard R. Licht, New Richmond, Wis.; Alan J. Marlor, Minneapolis, and Joseph C. Peisert, Saint Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 6, 1982, Ser. No. 366,098
Int. Cl.³ A62C *3/00*
U.S. Cl. 169—48 7 Claims



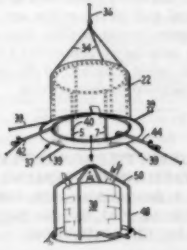
1. A fire protection system for installation about the periphery of a cable tray consisting of parallel side rails and spaced cross members fitted between the side rails, said fire protection system comprising component members formed from flexible, heat expanding, fire retardant composite sheet material having laminated on one major surface thereof a metal base layer, a wire netting laminated to the other major surface and an aluminum foil layer overlying said wire netting, said component members including a flat bottom portion, upraised longitudinally extending side portions, flanges extending laterally outwardly and parallel to said flat bottom portion along the longitudinal edge of each said side portion, a flat top member comprising a sheet of said fire retardant composite sheet material overlying said cable tray and juxtaposed and supported along its longitudinal edges by said laterally outwardly extending flanges of said side portions, elongated C-channel joining members fabricated from said fire retardant composite sheet material, coextensive with said laterally outwardly extending flanges, frictionally receiving and retaining within the throat thereof the juxtaposed longitudinal edge portion of said flat top member and each said laterally outwardly extending flange, and fastening means securing each said C-channel joining member and said juxtaposed longitudinal edge portion of said flat top member and said laterally outwardly extending flange together, said fire protection system being substantially noninsulating under ordinary ambient temperature conditions but becoming thermally insulating upon exposure to heat or flame.

4,433,733

OIL STORAGE TANK EXTINGUISHER

Byron H. Cunningham, 1661 Las Piedras Ct., Los Gatos, Calif. 95030

Filed Dec. 10, 1981, Ser. No. 329,183
Int. Cl.³ A62C *1/18*
U.S. Cl. 169—49 5 Claims



1. A fire extinguishing and protective device for an oil tank or the like comprising in combination:

a. a light framework forming a chamber having a closed top and closed sides and an open bottom, said chamber being somewhat larger than a fire source,

b. a flexible, fireproof material covering the sides and top of said chamber,

c. flexible flaps around the bottom of the sides,

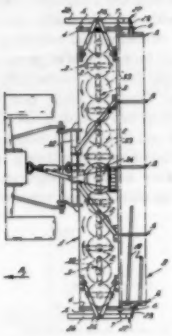
d. means for lifting and placing the chamber device over a source of fire and guying means to aid in placing the device and to maintain said flaps in a horizontal position, and means for lowering said chamber over the top and sides of the fire source to snuff out the fire.

4,433,734

SOIL CULTIVATING IMPLEMENT

Ary van der Lely, Maasland, and Cornelis J. G. Bom, Rozenburg, both of Netherlands, assignors to C. Van der Lely N.V., Maasland, Netherlands

Division of Ser. No. 181,422, Aug. 26, 1980, Pat. No. 4,344,490.
This application May 18, 1982, Ser. No. 379,291
Claims priority, application Netherlands, Sep. 5, 1979, 7906631
Int. Cl.³ A01B *33/06*
U.S. Cl. 172—68 **6 Claims**



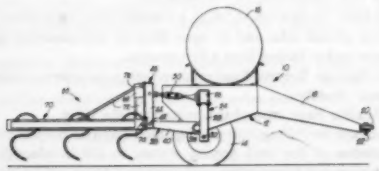
1. A soil cultivating implement comprising a plurality of soil working members that are arranged in a transverse row in side-by-side relationship, drive means connected to rotate said soil working members about upwardly extending shafts that define axes of rotation for said soil working members, an elongated ground engaging roller being positioned to the rear of said soil working members, said roller extending across the working width of said row of members, a side-plate being positioned adjacent an outer end of said row to arrest the lateral movement of worked soil, said side-plate being connected to the implement, soil guide means being positioned adjacent the rear of said side-plate and at least a part of said guide means extending towards an outer end of said roller, said guide means including an upper portion that is detachably connected to said side-plate and a lower blade that is inclined to said side plate and normally positioned adjacent the ground and between a lateral end of the roller and the rear of said side-plate, and an upper spring portion that spring-loads said guide means and is detachably connected to the rear of said side-plate, said blade being attached to the lower end of said spring portion and inclined to that portion.

4,433,735

SPRAYER TRAILER, TILLAGE IMPLEMENT AND HITCH FOR ATTACHING IMPLEMENT TO TRAILER

Otho A. Clark, Rte. 1, Independence, Mo. 64050

Filed Feb. 16, 1982, Ser. No. 349,266
Int. Cl.³ A01B *59/043*
U.S. Cl. 172—443 **10 Claims**



1. In combination with a sprayer trailer and a tillage implement, said sprayer trailer having a tongue at the normally forward end thereof provided with means for connecting the trailer to a towing vehicle, said implement being provided with framework, a hitch for attaching the implement to and behind the trailer comprising:

an implement carrier in the form of a single rigid frame member at the normally rear end of the trailer;

four point linkage directly interconnecting the trailer and the carrier;

power means interconnecting the linkage and the trailer for raising the carrier;

a standard mounted on the implement framework at the front of the latter; and

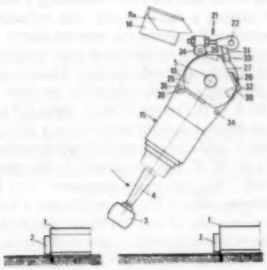
three point coupling means directly connecting the carrier with the standard and framework.

4,433,736

DEVICE FOR AVOIDING SECONDARY IMPACTS RESULTING FROM THE BOUNCES OF A MASS AGAINST A TARGET-MEMBER

Pierre-Claude Layotte, Les Mathes, and Laurent Bozec, Le Vesinet, both of France, assignors to Institut Francais du Petrole, Rueil-Malmaison and Compagnie Generale de Geophysique, Massy, both of, France

Filed May 11, 1982, Ser. No. 377,113
Claims priority, application France, May 11, 1981, 81 09474
Int. Cl.³ B23B *45/16*
U.S. Cl. 173—94 **6 Claims**



1. A device for avoiding secondary impacts of a mass (**3**) against a target member (**1**) due to the bounces of the mass after a first impact, the mass being secured to one end of a rigid arm (**4**) adapted to pivot about an axle (**5**) with respect to a support (**7**), and the device comprising means for maintaining the rigid arm apart from the target member after the first bounce, said means comprising a pawl (**21**) pivotable with respect to the support, at least one housing (**19**) for the pawl, provided in the rigid arm, and a temporization means for permitting the pawl to penetrate into its housing only after a first bounce of the mass against the target member, and the introduction of the pawl into its housing blocking the lowering motion of the rigid arm.

4,433,737

WATER JET SEDIMENT PROBE

Richard J. Malloy, Ojai, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 25, 1982, Ser. No. 361,713
Int. Cl.³ E21B *7/18*
U.S. Cl. 175—5 **8 Claims**

1. A water jet sediment probe system, operable to be spudded into sediment by a single person without assistance for jetting straight holes of indefinite depth, comprising:

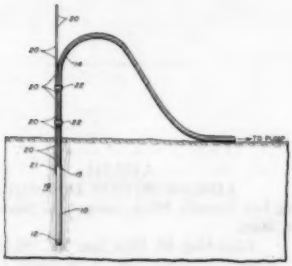
a. a source of water under pressure,

b. a probe means,

c. a flexible hose having one end thereof connected to said source of water and the other end connected to said probe means,

d. said probe means consisting substantially of a short rigid length of pipe having a jet end and a connector end; said connector end being connected to the other end of said flexible hose wherein water under pressure from said source passes through said flexible hose and is jetted from the jet end of said probe means for liquifying sediment;

e. a hose stiffening means connected to said probe means and comprising a plurality of rigid sectional means operable to



be connected together section by section in series and in straight alignment for increasing the rigid length thereof as desired from the connector end of said probe means; said hose stiffening means additively holding consecutive portions of said flexible hose in a rigid manner and in straight alignment with said probe means to permit said probe means together with a desired rigidized length of said flexible hose to be spudded into sediment by liquification thereof to a desired depth without necessitating the interruption of water flow through said flexible hose and said probe means.

4,433,738

METHOD AND APPARATUS FOR USE WHEN CHANGING THE DIRECTION OF A WELL BORE

Ernest W. Moreland, Rte. 4, Box 24, New Iberia, La. 70560

Filed Dec. 24, 1981, Ser. No. 334,259

Int. Cl.³ E21B *7/06*

U.S. Cl. 175—61 **1 Claim**

1. A method of changing the direction of a well bore comprising the steps of drilling a section of a well bore using a downhole motor to rotate the bit and a bent sub to change the direction of the well bore the desired amount, removing the bent sub, downhole motor and bit from the well bore, reaming the section of the well bore drilled with the downhole motor with a reamer of the same diameter as the bit used to change the direction of the well bore and the drilling assembly to be used to drill ahead, removing the reamer and the drilling assembly from the well bore, replacing the reamer with a drilling bit of the same diameter as the previously used bit, running the bit and drilling assembly to the bottom of the well bore, and drilling ahead in the desired direction.

4,433,739

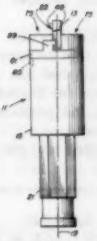
MINING DRILL

Vinod K. Sarin, Lexington, Mass., assignor to GTE Laboratories, Inc., Waltham, Mass.

Filed Feb. 8, 1982, Ser. No. 346,971

Int. Cl.³ E21B *10/62*

U.S. Cl. 175—410 **1 Claim**

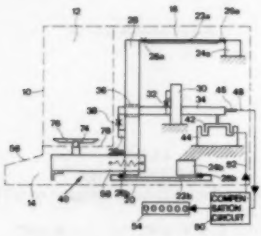


1. A mine drill for aiding collection of detritus during drilling comprising a drive body being cylindrically and tubularly shaped about an axis of rotation and having an axial passage for the flow of detritus, an elongated insert mounted at the forward end of said drive body for movement about said axis of rotation whereby leading insert surfaces are presented forward of trailing insert surfaces in the direction of rotation, said insert forwardly projecting cutting edges, a base surface, side surfaces intermediate end portions and normal to said base surface extending toward said cutting edges, said base surface lying in a plane substantially normal to the axis of rotation, said drive body having a support surface and a pair of flanges projecting forwardly in an axial direction forming a pair of diametrically opposed passageways for the flow of detritus, each flange being an extension of the tubularly shaped drive body, each passageway being formed by a respective outwardly facing insert surface and inwardly facing flange surface, each flange having an insert engaging surface projecting in the axial direction for transmitting torsional forces of said drive body to said insert, said drive body including a circumferential groove adjacent said flanges said, insert being mounted to said drive body with said base surface engaging said support surface and said respective trailing insert surfaces, a keeper ring including a projecting key portion mounted in said circumferential groove, said keeper ring including a pair of tab portions projecting in the forward direction, each tab having a protrusion projecting in the circumferential direction, said insert including a pair of notches, each notch being positioned on a respective side surface for receiving a respective tab portion, each tab engaging a respective notch for preventing forward release of said insert.

4,433,740
WEIGHING APPARATUS INCLUDING A RESILIENTLY CONNECTED SCALE PAN CARRIER

Paul Lüchinger, Uster, Switzerland, assignor to Mettler Instrument AG, Greifensee, Switzerland

Filed Feb. 8, 1982, Ser. No. 346,759
Claims priority, application Switzerland, Apr. 10, 1981, 2417/81
Int. Cl.³ G01G *21/10, 3/08*
U.S. Cl. 177—187 **8 Claims**



1. In a weighing apparatus of the type including a housing (10), a load receiving member (28), and means (22*a*, 22*b*) connecting said load receiving member for vertical movement relative to said housing;

the improvement which comprises

scale pan carrier means (40) for supporting a scale pan (76);

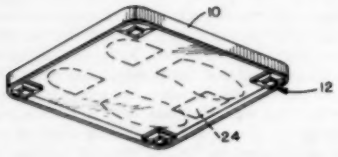
means (86, 88) connecting said pan carrier means with said load receiving member for limited horizontal movement between first and second positions relative to said load receiving member; and

resilient means (82) biasing said pan carrier means toward said first position.

4,433,741
STRAIN GAGE SCALE

William D. Ryckman, Jr., Orange, Conn., assignor to General Electric Company, New York, N.Y.

Filed Apr. 12, 1982, Ser. No. 367,360
Int. Cl.³ G01G *3/14, 21/23*
U.S. Cl. 177—199 **3 Claims**



1. In a strain gage weighing scale with a load platform, a plurality of individually spaced foot structures supporting said platform, an improvement in each foot structure of a sandwich construction comprising,

a bottom support plate,

a pair of spaced first fulcrums on said plate,

a floating beam plate on said first fulcrums and spaced above and substantially coextensive with said bottom plate,

said plates being substantially flat, square, hard metallic plates and interchangeable in said sandwich,

a pair of differently spaced and equally offset second fulcrums on said beam plate supporting said platform,

strain gage means secured to said beam plate between the closer pair of fulcrums,

means connected to said gage means converting the gage resistance change under load to read the weight of the load,

an integral, deformable plastic housing supporting and securing the plates and fulcrums together,

the sides of said plastic housing including a plurality of vertical barbs,

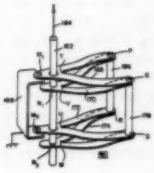
elongated slots in said platform receiving said barbs locking said sandwich together against said platform, and

a support cup on the bottom of said housing conformed to flatten under load along and against the support plate thus spreading the barbs along said slots to remove friction therebetween while maintaining said sandwich together on and against said support plate.

4,433,742
LINEAR MOTION LINKAGE

Shih-Ying Lee, Lincoln, Mass., assignor to Setra Systems, Inc., Acton, Mass.

Filed May 19, 1981, Ser. No. 265,092
Int. Cl.³ G01G *3/08, 21/24;* E04G *3/00*
U.S. Cl. 177—229 **4 Claims**



1. Linkage for constraining motion of a reference member to be along a reference axis, said reference axis being fixed with respect to a support member, comprising:

two pairs of flexure elements, having corresponding vertex end, flexure, and distal end portions, each of said flexure elements having a vertex end portion and at least one flexure portion extending therefrom and terminating in an associated distal end portion,

a rigid coupling member associated with each set of corresponding distal end portions of said two pairs,

wherein the corresponding distal end portions of each pair are coupled to each other,

wherein said coupling members couple the respective junctions of the distal end portions of the first pair of flexure elements to the respective junctions of the corresponding distal end portions of the second pair at points separated by a predetermined distance in the direction of said reference axis,

wherein the vertex portions of said first pair of flexure elements are equidistant from the corresponding distal portions of those elements,

wherein the vertex portions of said second pair of flexure elements are equidistant from the corresponding distal end portions of those elements,

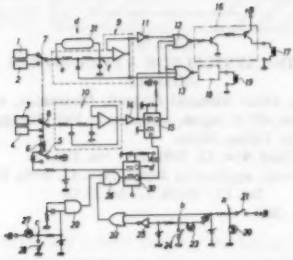
wherein the vertex portions of upper flexure element of each pair are coupled to said reference member at points separated in the direction of said reference axis by a direction substantially equal to said predetermined distance, and

wherein the vertex portions of the lower flexure element of each pair are coupled to said support member at points separated in the direction of said reference axis by a distance substantially equal to said predetermined distance.

4,433,743
CONTROL CIRCUIT FOR VEHICLE LEVEL ADJUSTING APPARATUS

Taiji Ohmori; Toshio Kasahara, and Yoshiaki Uchida, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 24, 1982, Ser. No. 351,856
Claims priority, application Japan, Feb. 25, 1981, 56-26558
Int. Cl.³ B60G *17/00*
U.S. Cl. 180—41 **4 Claims**



1. In a control circuit for a vehicle level adjusting apparatus including:

a first circuit which receives at least one first signal based on a comparison between a reference vehicle level range and an actual vehicle level to make a judgment as to the necessity of an adjustment of the vehicle level and issues a second signal, said second signal having a first signal status when said adjustment is judged to be necessary and a second signal status when said adjustment is judged to be unnecessary;

a second circuit comprising a monostable multivibrator which receives said second signal and issues a third signal based on said second signal status of said second signal, as prolonged by a predetermined time in a normal state of said second circuit and as not prolonged in a reset state of said second circuit;

a third circuit which receives said third signal and issues a control signal to said vehicle level adjusting apparatus;

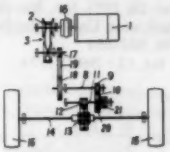
an improvement comprising: a fourth circuit, connected to a reset terminal of said second circuit, which receives a fourth signal based on a halt state of said vehicle and a fifth signal based on an operation of a door of said vehicle, and resets said second circuit.

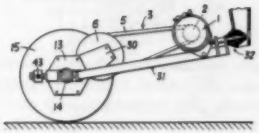
4,433,744
BATTERY POWERED ELECTRIC MOTOR VEHICLE

Karl Mühlbacher, 12, Fischerhofweg, Graz, Austria

Filed Sep. 9, 1981, Ser. No. 300,555
Claims priority, application Austria, Sep. 30, 1980, 4892/80
Int. Cl.³ B60K *1/00*
U.S. Cl. 180—65 E **6 Claims**

1. A battery-powered electric motor vehicle comprising a vehicle frame and an electric motor with a main shaft being connected to a differential gear by means of a gear train with a continuously variable transmission ratio, with said differential gear driving a rigid-type axle of the driving wheels of said electric motor vehicle, and with said main shaft and all gear shafts being parallel to said axle of said driving wheel, wherein said electric motor and said variable transmission gear are mounted on a subframe, which is connected to a housing of said rigid-type axle on the one side, whereas the other side thereof, which is carrying said electric motor, is attached to said vehicle frame by means of a cardanic suspension, and a transverse link having one end hinged to said vehicle frame and its other end hinged to said axle housing whereby said axle



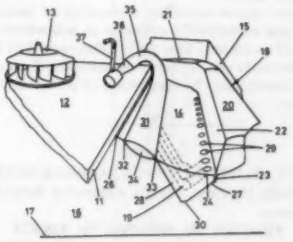


housing can be aligned normally to the direction of motion by means of said link.

4,433,745
AIR CUSHION VEHICLE

Kay Rollins; Anthony N. Key, both of Ryde, and Thomas F. Arlotte, Newport, all of England, assignors to British Hovercraft Corporation Ltd., Yeovil, England

Filed Jul. 7, 1981, Ser. No. 281,247
Claims priority, application United Kingdom, Jul. 14, 1980, 8022985
Int. Cl.³ B60V *1/11*
U.S. Cl. 180—118 **3 Claims**



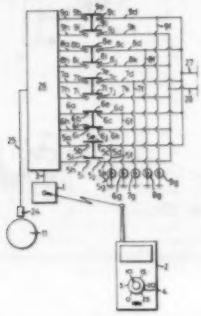
1. An air cushion vehicle including a rigid body structure, a plenum chamber in said rigid body structure, at least one lift fan for supplying pressurized air to said plenum chamber, cushion sealing means including a flexible skirt structure extending below the rigid body structure to contain the air cushion, an elongate strip secured to the flexible skirt structure to form at least one inflatable member on said flexible skirt structure, a duct extending from said inflatable member to said plenum chamber, means for providing a source of high pressure air, air ejector means in said duct, said air ejector means including a conduit providing a passageway from said source of high pressure air to said duct whereby the geometry of said inflatable member may be rapidly changed from an uninflated shape to an inflated shape to simultaneously effect a change in the geometry of the flexible wall structure to provide directional control of the air cushion vehicle.

4,433,746

VEHICLE SPEED CONTROL

James Steel, Newcastle Upon Tyne, England, assignor to Ogden Electronics Ltd., Yorkshire, England

Filed Mar. 18, 1981, Ser. No. 245,205
Claims priority, application United Kingdom, Mar. 19, 1980, 8009243; Sep. 25, 1980, 8031051
Int. Cl.³ B60Q 1/54
U.S. Cl. 180—171 9 Claims



1. Apparatus for controlling the speed of a vehicle having a retarder, the apparatus comprising:

means for transmitting first signals indicative of a reference speed to said vehicle and for receiving same thereat,

means for generating second signals indicative of speed of the vehicle,

means for comparing the first and second signals and for generating third signals when the second signals indicate that the speed of the vehicle is in excess of the reference speed, and

control means automatically responsive to the third signals, the control means being adapted to automatically control operation of the retarder so that, when the speed of the vehicle exceeds the reference speed, the vehicle is retarded by the retarder until the vehicle speed is below the reference speed,

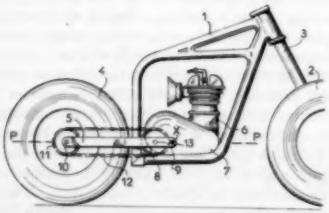
said control means including a plurality of devices successively and sequentially operable in accordance with the length of an elapsed time period during which the vehicle speed exceeds the reference speed, said devices progressively controlling the magnitude of power applied to the retarder.

4,433,747

MOTORCYCLE WITH IMPROVED REAR SUSPENSION

Eric Offenstadt, Pontoise, France, assignor to Sercati S.A.R.L., Paris, France

Filed Nov. 30, 1981, Ser. No. 325,873
Claims priority, application France, Dec. 1, 1980, 80 25479
Int. Cl.³ B62K 25/02
U.S. Cl. 180—227 13 Claims



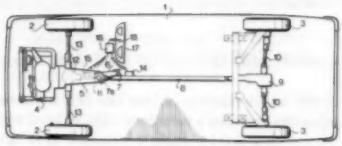
1. A motorcycle comprising a frame, front and rear wheels, suspension means guiding said rear wheel for travel relative to said frame in an arc about a suspension travel axis, a motor secured to said frame, and transmission means for transmitting drive from said motor to said rear wheel, said transmission means including a driven pinion connected to the rear wheel axle, a driving pinion mounted on the frame and a flexible loop connecting said pinions whereby tension in said loop transmits drive from said driving pinion to said driven pinion, characterised in that said suspension travel axis is disposed in front of the axis of said driving pinion, whereby tension in said loop tends to reduce excursions of said rear wheel under acceleration.

4,433,748

INSTRUCTING SYSTEM FOR A FOUR-WHEEL DRIVE VEHICLE

Tetsuo Satoh, Ohta; Masaaki Ohgami, Musashino, and Shoji Ogata, Ohta, all of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 12, 1981, Ser. No. 320,776
Claims priority, application Japan, Nov. 11, 1980, 55-158352
Int. Cl.³ B60K 17/34, 23/08
U.S. Cl. 180—247 7 Claims



1. An instruction system for a four-wheel drive vehicle powered by an internal combustion engine, comprising

a transmission means for transmitting power from said engine to two main driving wheels,

a clutch means for selectively transmitting said power to two auxiliary wheels,

a select lever means for engaging said clutch means,

speed detector means for detecting speed of said two main driving wheels and said two auxiliary wheels, respectively, and for producing first and second voltage pulse trains dependent on the speed of the main driving wheels and auxiliary wheels, respectively,

first and second integrator means for integrating said first and second voltage pulse trains,

amplifier means for amplifying the difference between the integrated voltages from said first and second integrator means,

comparator means for comparing the output of said amplifier means with a reference value and for producing an output voltage when said output is higher than said reference value, and

indicating means responsive to the output voltage of said comparator means for signaling a slipping of the wheels.

4,433,749

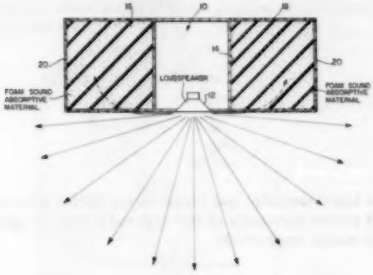
ACOUSTIC REAR RADIATION ABSORPTION FOR LOUDSPEAKER SYSTEMS

William H. Watkins, and William D. Watkins, both of 1244 Caribbean Dr., Kingsport, Tenn. 37660

Filed Feb. 19, 1982, Ser. No. 350,183
Int. Cl.³ H05K 5/00
U.S. Cl. 181—151 3 Claims

1. In a loudspeaker system including a loudspeaker located within a housing, the improvement comprising sound absorbing means, comprising sound absorptive damping material supported directly on the outside of the loudspeaker housing and extending outwardly a substantial distance from both sides thereof, for absorbing sound coming from the front of the loudspeaker which travels from the loudspeaker in direction

towards the rear of the loudspeaker system so as to prevent this sound from being reflected from a wall located behind the loudspeaker system, thereby permitting the loudspeaker system to more accurately reproduce the recording site ambience inherent in a recording played by the system and to permit



more accurate and natural imaging, the lateral extent of the sound absorptive material on both sides of the housing being on at least the order of the width of the housing such as to provide absorption of substantially all of the sound from the loudspeaker which travels in direction towards the rear of the loundspeaker system.

4,433,750

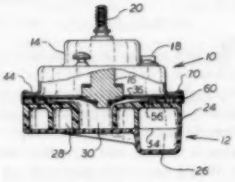
SYNTHETIC HORN PROJECTOR WITH METAL INSERT

James A. Neese, Flora, Ill., assignor to Sparton Corporation, Jackson, Mich.

Continuation-in-part of Ser. No. 236,662, Feb. 23, 1981, Pat. No. 4,361,952. This application Jan. 15, 1982, Ser. No. 339,319

Int. Cl.³ B60Q *5/00*; G10K *11/00*

U.S. Cl. 181—179 **6 Claims**



1. As an article of manufacture, a molded synthetic plastic electric horn projector having an annular planar surface defined thereon for mounting the projector upon a motor subassembly having a flange portion, a metal insert integrally molded into the material of said projector, and a deformable metal flange of annular configuration defined upon said insert surrounding said mounting surface and projecting from said projector configuration adjacent said mounting surface intersecting the plane of said mounting surface and extending therebeyond for deformation upon the subassembly flange portion.

4,433,751

SOUND SUPPRESSOR LINER

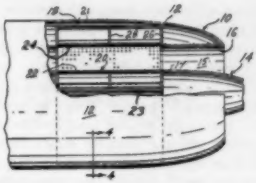
Hilaire Bonneau, Boucherville, Canada, assignor to Pratt & Whitney Aircraft of Canada Limited, Longueuil, Canada

Filed Dec. 9, 1981, Ser. No. 329,008

Int. Cl.³ F01N *1/02*

U.S. Cl. 181—213 **5 Claims**

1. A suppressor liner comprising a first shell and a second shell spaced from the first shell with the second shell being permeable to sound and in contact with a gas path, sheet metal members forming a plurality of attenuator cells, each cell defining a cavity and having inlet passage means therein and constituting a battery of cells between the first shell and the second shell, the adjacent cells in the battery being formed by similarly formed sheet metal members with each member having a first concavely curved section relative to the second shell and forming a wall of the inlet passage of a first cell, a



second continuing convexly curved section relative to the gas path and forming a portion of the cavity of a second cell with the first shell, an inwardly looped third section forming the convex wall of the inlet passage of the second cell such that each sheet metal member overlaps an adjacent member to form subsequent cells.

4,433,752

RESCUE SYSTEM ON HIGH-RISE BUILDINGS

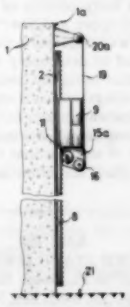
Franz-Josef Günter, Grevenbroich, Fed. Rep. of Germany, assignor to Walther & Cie. Aktiengesellschaft, Cologne-Dellbrück, Fed. Rep. of Germany

Filed Oct. 14, 1981, Ser. No. 311,304

Claims priority, application Fed. Rep. of Germany, Nov. 14, 1980, 3042953

Int. Cl.³ A62B *1/02*; B66B *9/00*

U.S. Cl. 182—82 **5 Claims**



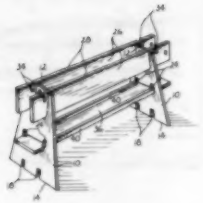
1. A rescue device for evacuating persons from a high-rise building, comprising an upright climb rail mounted on a face wall of the building and having an elongated rack; a movable rescue cabin provided with a gear engageable with said rack; drive means and a transmission unit interconnected between said gear and said drive means for moving said cabin upwardly and downwardly along said rack, said drive means including a cable drum connected to said transmission unit for rotation of said drum and having a cable wound thereon; and a deflecting roller positioned above said rail and secured to said face wall at the highest possible location thereto, said cable being taken up by said roller from said cable and guided from said drum in the upward direction to and about said deflecting roller so that the weight of the rescue cabin during its movement upwardly and downwardly is at least partially absorbed by said cable.

4,433,753

WORK SUPPORTING APPARATUS

Marshall Watson, P.O. Box 474, Sublette, Kans. 67877

Filed Aug. 11, 1982, Ser. No. 407,033
Int. Cl.³ B27B *21/00*; A47B *37/00*
U.S. Cl. 182—151 **10 Claims**



1. Work supporting apparatus having a unit comprising:

a pair of legs each having a substantially solid body portion tapering from bottom to top, each leg having a lower edge for engagement with a support surface and an upper edge presenting a pair of spaced apart slots therein;

a pair of elongated rails each having a longitudinal axis and upper and lower edges extending generally parallel to said longitudinal axis;

a pair of slots in the lower edge of each rail near opposite ends thereof sized to detachably interlock with the slots in the upper edges of said legs in a manner to connect the legs and rails together with the legs spaced apart and the rails spaced apart in extension between the legs to provide a space between the rails and above the legs for receiving a work supporting member in an assembled condition of the unit;

a rigid brace having opposite side edges and a pair of slots near opposite ends of each side edge, said brace presenting an upper surface adapted to receive and hold objects thereon and upstanding lips on each side edge to maintain objects on said upper surface; and

an opening in the body portion of each leg at a location intermediate said upper and lower edges of the leg, each opening having a configuration to receive an end portion of said brace and to detachably interlock with the slots thereof in a manner to rigidly connect said brace in extension between said legs with said upper surface in a substantially horizontal orientation to receive and hold objects in the assembled condition of the unit, each opening further including a pair of slot portions sized and located to receive said lips when the brace is extended through the opening.

4,433,754

STEPLADDER STABILIZER ASSEMBLY

John Beach, 435 E. 157th Pl., South Holland, Ill. 60473

Filed Nov. 13, 1981, Ser. No. 320,856
Int. Cl.³ E06C *1/20*
U.S. Cl. 182—172 **6 Claims**

1. A stabilizer assembly for use with a stepladder having a top end platform associated with spaced apart side rails, said top end platform having a lateral dimension and first and second lateral ends, said assembly comprising a single board having a top and a bottom surface, and substantially opposing first and second side ends, said board being removably secured by a plurality of fastening means to said top end platform in such a manner that said first side end extends laterally at least to said first lateral end of said top end platform and said second side end extends laterally at least to said second lateral end of said top end platform; first and second hinge means associated with said bottom surface of said board at or near said first and second side ends of said board, respectively; and first and second elongated support means associated with said first and second hinge means, respectively, and extending from said secured single board to improve the stability of said stepladder, and said first and second hinge means are situated relative to

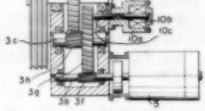
said board such that said boards means further acts to restrict said pivotal movement of said first and second elongated support means, respectively.

4,433,755

ELEVATOR APPARATUS

Sadayuki Ohtomi, Inazawa, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 20, 1981, Ser. No. 265,677
Claims priority, application Japan, Jun. 3, 1980, 55-74489
Int. Cl.³ B66B *11/04*
U.S. Cl. 187—20 **3 Claims**



3. In an elevator apparatus comprising a reduction gear unit having a reduction mechanism of rotary parts of parallel axial gears, an input shaft and an output shaft as main parts; a main rope suspending a car and a counterweight; a traction sheave which is directly connected to said output shaft and on which said main rope is wound; and a traction motor for rotating said input shaft of said reduction gear unit, an improvement comprising a friction device for imparting pushing force to said rotary parts of said reduction gear unit;

wherein said friction device comprises a body which is fitted on the outer surface of said reduction gear unit and which holds an electromagnetic coil inside;

a friction member whose one end is placed to face the side surface of said rotary parts of said reduction gear unit and whose other end is inserted in said electromagnetic coil;

wherein said improvement further comprises control means for detecting a balance of the weight of said car and said counterweight, and for actuating said electromagnetic coil when said balance is detected.

4,433,756

ELEVATOR SYSTEM

William R. Caputo, Wyckoff, and Alan L. Husson, Hackettstown, both of N.J., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 10, 1982, Ser. No. 356,685
Int. Cl.³ B66B *3/02*
U.S. Cl. 187—29 R **25 Claims**

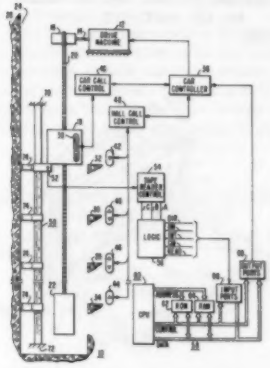
1. An elevator system, comprising:

a building having a hoistway and a plurality of floors,

an elevator car mounted for vertical movement in the hoistway of said building to serve the floors therein,

elevator control means for controlling the movement of said elevator car,

and a vertically extending, extensible coded tape in said hoistway, which, in cooperation with said elevator control means, identifies the absolute position of said elevator in said hoistway,



said tape being tensioned and stretched a predetermined dimension beyond its untensioned length, and fixed at predetermined locations such that the positional relationship between at least certain of the floors and the tape remains unchanged, notwithstanding compression of said building.

4,433,757

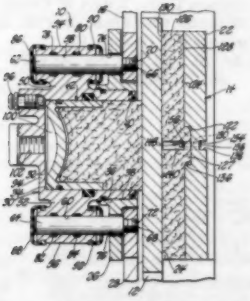
DISC BRAKE LINING RETAINER AND WEAR WARNING ARRANGEMENT

Edward H. Warwick, Englewood, and Donald L. Parker, Middletown, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 1, 1982, Ser. No. 353,414

Int. Cl.³ F16D *66/00*

U.S. Cl. 188—1.11 **1 Claim**



1. In a disc brake caliper having a caliper leg on one side of a disc to be braked and a friction bracking element mounted on said leg for selective friction braking engagement with the disc one side, the improvement comprising:

said friction braking element consisting solely of friction brake lining material having a friction braking surface facing the disc one side and a caliper leg mounting surface facing and in surface engagement relation with said caliper leg, and at least one boss integrally formed therewith and extending outwardly of said mounting surface;

said caliper leg having at least one recess formed therein receiving said at least one boss therein in mating relation with the side wall of said boss engaging the side wall of said recess and being of sufficient area to transmit brake torque therethrough;

and retaining means holding said friction braking element on said caliper leg in position for friction braking engagement with the disc one side and permitting ready removal and replacement of said friction braking element as needed, said retaining means comprising

a spring clip located within aligned openings in said boss and the bottom wall of said caliper leg recess and having a spring portion and a securing portion spring loaded by said spring portion to continually urge said boss into full mating relation with said caliper leg recess, and having a tab formed to extend toward the disc to engage the disc only upon a predetermined amount of lining material wear and only during brake actuation to generate a lining wear warning noise.

4,433,758

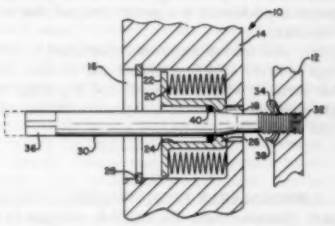
BRAKE ADJUSTER HAVING A ROD DRAWN THROUGH A DRAW RING

Richard L. Crossman, Tallmadge, Ohio, assignor to Goodyear Aerospace Corporation, Akron, Ohio

Filed Aug. 14, 1978, Ser. No. 933,321

Int. Cl.³ F16D *65/52*

U.S. Cl. 188—196 R **8 Claims**



1. A brake adjuster assembly for interconnection between the pressure plate and the brake housing of a wheel of a vehicle, comprising:

a support member maintained in fixed relationship to the brake housing;

reciprocating means operatively associated with said support member for reciprocating movement between first and second ends thereof;

a draw ring carried by said reciprocating means and movable therewith;

a rod passing through said draw ring and connected at one end thereof to the pressure plate, said draw ring being in swaging and reshaping engagement with said rod; and

wherein said rod is a fluted rod having ribs thereon in said swaging and reshaping engagement with said draw ring.

4,433,759

GAS SPRING

Hisao Ichinose, Yokohama, Japan, assignor to Nissan Motor Co. Ltd., Yokohama, Japan

Filed Aug. 4, 1981, Ser. No. 289,858

Claims priority, application Japan, Sep. 11, 1980, 55-129573

Int. Cl.³ F16F *9/19*

U.S. Cl. 188—282 **14 Claims**

1. A gas spring comprising:

a cylinder;

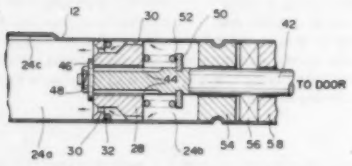
a free piston axially slidably and sealingly received in said

cylinder to divide the interior of said cylinder into a gas chamber and a working liquid chamber;

a piston axially slidably received in said working liquid chamber to divide the same into first and second working liquid chamber sections, the first section being located in the vicinity of said gas chamber;

a piston rod connected at its one end to said piston and extending therefrom through said second working liquid chamber section to project axially outwardly from said cylinder;

a first valve means for providing a passage between said first and second working liquid chamber sections only when said piston moves in a direction to contract said second working liquid chamber section;



a second valve means for providing a passage between said first and second working liquid chamber sections only when said piston moves in a direction to contract said first working liquid chamber section; and

a third means for providing an additional passage when said piston is positioned in a predetermined area near said gas chamber,

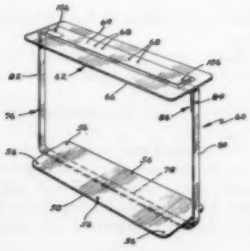
wherein said second means is constructed to form the passage between said first and second working liquid chamber sections when said piston rod is pushed toward said gas chamber to provide a displacement thereof relative to said piston.

4,433,760

DEFORMABLE LIGHTWEIGHT LUGGAGE

Joseph Y. Pelavin, North Bergen, N.J., assignor to CPG Products Corp., Minneapolis, Minn.

Filed Feb. 25, 1982, Ser. No. 352,482
Int. Cl.³ A45G *13/04*
U.S. Cl. 190—115 **22 Claims**



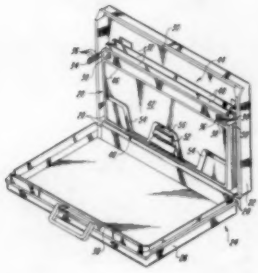
1. Luggage comprising a pliable cover material forming flexible top, bottom, end, front and rear walls, a plate overlying said bottom wall and generally coextensive therewith, a metallic spring band having a section underlying only the central portion of said plate and spaced inwardly from said front and rear walls, said spring band including upwardly extending integral leg sections confronting only central portions of said end walls and spaced inwardly from said front and rear walls, a panel underlying said top wall and generally coextensive therewith, and respective means fixedly connecting and fastening centrally disposed end portions of said panel to the upper ends of said leg sections.

4,433,761

PORTFOLIO WITH FRAME AND INTEGRAL ARTICLE RETAINERS

Roger D. Winter, Lakewood; David E. Workman, Evergreen, and Mark B. Nordstrom, Denver, all of Colo., assignors to Samsonite Corporation, Denver, Colo.

Filed Jan. 27, 1982, Ser. No. 343,252
Int. Cl.³ A45C *3/02, 13/04*
U.S. Cl. 190—109 **31 Claims**



1. A portfolio comprising:

portfolio frame having a peripheral margin structure defining an interior opening through the portfolio frame;

a backing panel extending over the interior opening and operatively connected to the portfolio frame to substantially resist forces applied thereto; and

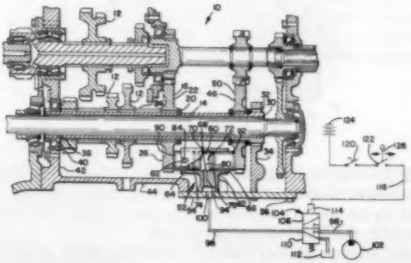
article retaining means operatively connected to the peripheral margin structure and extending into the interior opening adjacent the backing panel, said article retaining means resiliently deflectable to a deflected position spaced away from the backing panel and operatively developing retaining force through the operative connection to the portfolio frame for retaining articles in the space between the backing panel and the deflected article retaining means.

4,433,762

OPPOSED REACTION TRANSMISSION BRAKE

Josef F. Prokop, Downers Grove; Robert R. Coons, Hinsdale, and Richard H. Mylander, Glen Ellyn, all of Ill., assignors to International Harvester Co., Chicago, Ill.

Filed Jul. 30, 1981, Ser. No. 288,623
Int. Cl.³ B60K *41/28*
U.S. Cl. 192—4 A **18 Claims**



1. In a transmission having a housing containing a rotatable shaft to which a plurality of constant mesh gears are mounted,

a source of fluid pressure and a source of electrical energy, the improvement comprising:

a transmission access plate having a fluid access port;

a dual piston opposed reaction brake mounted to the interior surface of said transmission access plate between a pair of said constant mesh gears;

a solenoid operated two position valve having a supply conduit connecting it hydraulically with said source of fluid pressure and said dual piston opposed reaction brake and an electrical circuit connecting it electrically to said source of electrical energy;

a clutch pedal foot operated switch in said electrical circuit;

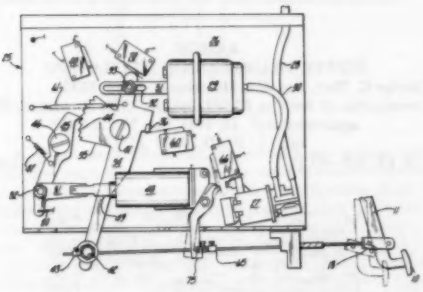
a lever actuated switch in series with said clutch pedal foot operated switch in said electrical circuit whereby said dual piston opposed reaction brake will be actuated hydraulically upon the simultaneous closing of said clutch pedal foot operated switch and said lever actuated switch.

4,433,763

SOLENOID OPERATED SERVICE BRAKE APPLICATION UNIT

Vincent P. Lizzio, 45 Moorland Dr., Grosse Pointe Shores, Mich. 48236

Filed Jun. 2, 1982, Ser. No. 365,521
Int. Cl.³ B60K *41/26*
U.S. Cl. 192—4 A **15 Claims**



1. A method for an application and release of the service brake of an automotive-type transmission equipped vehicle having a transmission selector level after the operator of said vehicle has brought the vehicle to a stop by application of pressure to said service brake, said method including the steps of:

(a) placing the transmission selector lever of said vehicle in a first predetermined position while pressure is still being applied to said service brake;

(b) causing a restraining means to apply force to said service brake and keep said force applied while said transmission selector lever is in said first predetermined position, thereby keeping the service brake of said vehicle applied; and

(c) causing said service brake to remain applied until said operator places said transmission selector lever in a second predetermined position and applies a slight additional pressure, over that initially applied, to the service brake of said vehicle.

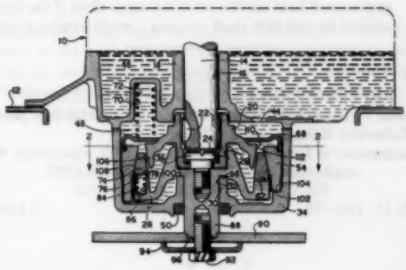
4,433,764

CLUTCH-BRAKE ASSEMBLY

Edward J. Goscenski, Jr., Battle Creek, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Sep. 4, 1981, Ser. No. 299,454
Int. Cl.³ F16D *11/06*
U.S. Cl. 192—18 R **19 Claims**

1. A clutch-brake assembly for controlling the transmission of power between a source such as an engine, a use element such as a rotating blade, and a support element such as a frame, comprising, in combination with oil: a housing adapted to be secured to said support element and retain said oil; an input member located within said housing, mounted for rotation about an axis, adapted to be secured to said source for driving rotation, and having a clutching surface; an output member mounted for rotation about said axis and having a cam surface facing said clutching surface; a friction member located within said housing and having a friction surface juxtaposition said clutching surface and a cam surface engaging said cam surface of said output member whereby rotational movement of said friction member and said output member relative to one another will result in axial movement of said friction member relative to said output member; a brake member in said housing having a braking surface juxtaposition said friction surface and mounted for axial movement with respect to said housing a distance to engage said braking and friction surfaces and move said friction surface out of engagement with said clutching surface; means axially biasing said friction member toward said input and braking members and away from said output member; means axially biasing said brake member toward said friction member; and means to move said brake member away from said friction member against the force of said brake biasing means a distance to allow said friction biasing means to move said friction member into engagement with said clutching surface.

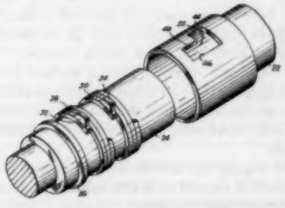


4,433,765

SPRING CLUTCHES

Edward T. Rude, Fairfield; Jules Nisenson, Stamford, and Martin Waine, Riverside, all of Conn., assignors to General Clutch Corp., New York, N.Y.

Filed Sep. 13, 1982, Ser. No. 417,227
Int. Cl.³ F16D *7/02, 1/00, 49/20*
U.S. Cl. 192—41 S **7 Claims**



1. A spring clutch comprising a first shaft, a coaxially mounted second shaft, and at least first and second springs, helically wound and coaxially disposed between said first and second shafts, for making frictional contact with said first shaft,

said at least first and second springs each having a tab near at least one end, said tabs being radially directed toward said second shaft,

said second shaft having at least first and second load surfaces for engaging respective ones of said tabs,

rotation of one of said shafts in at least one direction causing said at least first and second springs to rotate therewith and to apply a torque in the same direction to the other of said shafts,

said tab near said one end of said first spring making contact with said first load surface of said second shaft before said tab near said one end of said second spring makes contact with said second load surface of said second shaft, said first spring slipping on said first shaft prior to said tab near said one end of said second spring making contact with said second load surface of said second shaft if the torque applied to said first shaft exceeds a predetermined value.

4,433,766

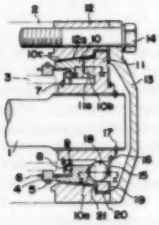
BI-DIRECTIONAL OVERRUNNING CLUTCH

Masao Teraoka, Sano, Japan, assignor to Tochigi-Fuji Sangyo Kabushiki Kaisha, Tochigi, Japan

Continuation of Ser. No. 47,804, Jun. 11, 1979, abandoned. This application Nov. 20, 1981, Ser. No. 323,709

Int. Cl.³ F16D *21/08, 41/06, 41/22*

U.S. Cl. 192—50 **5 Claims**



1. A bi-directional overrunning clutch, particularly for use in a hub drive assembly wherein the hub is selectively freely rotatable or positively driven, said clutch comprising:

drive shaft means selectively operationally in a driving mode and rotating to transmit a rotational driving force and in a non-driving mode to interrupt said rotational driving force;

a drive clutch member fixedly assembled on said drive shaft means to rotate therewith during said driving mode thereof;

a driven clutch member positioned to receive rotational movement from said drive clutch member during said driving mode of said drive shaft means, said driven clutch member being mounted for relative axial movement with respect to said drive clutch member and said drive shaft means between an operative position axially spaced from said drive clutch member and an inoperative position axially adjacent said drive clutch member;

said driven clutch member having surface means for drivingly engaging the hub when said driven clutch member is in said operative position thereof and for transmitting said rotational movement from said drive clutch member to the hub;

means for urging said driven clutch member to said inoperative position thereof such that said surface means is out of engagement with the hub;

said drive clutch member and said driven clutch member having therebetween separate first and second engagement means for transmitting said rotational movement of said drive clutch member to said driven clutch member and for, upon rotation of said drive clutch member, moving said driven clutch member to said operative position against the force of said urging means;

said first engagement means comprising a first pair of cam surfaces including a surface of said driven clutch member inclined circumferentially of said driven clutch member and a surface of an element associated with said drive clutch member;

said second engagement means comprising a second pair of cam surfaces including surfaces on said driven clutch member and said drive clutch member inclined circumferentially of said driven clutch member and said drive clutch member;

the angle of said inclined surface of said driven clutch member of said first pair of cam surfaces being greater than the angle of said inclined surfaces of said driven clutch member and said drive clutch member of said second pair of cam surfaces, taken in directions circumferentially of said driven clutch member and said drive clutch member, and said first pair of cam surfaces being in contact when said driven clutch member is in said inoperative position thereof, such that said first and second pairs of cam surfaces are sequentially operable to maintain said driven clutch member in said operative position thereof during said drive mode of said drive shaft means; and

said driven clutch member including brake means for, upon interruption of said driving mode of said drive shaft means, retarding continued rotation of said driven clutch member and enabling said urging means to move said driven clutch member to said inoperative position thereof.

4,433,767

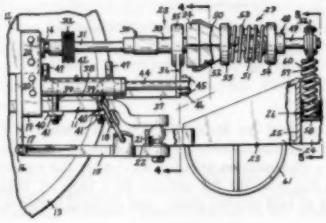
POWER TRANSMISSION MECHANISM

Charles C. Thor, Box 654, Hutchinson, Minn. 55350

Continuation of Ser. No. 57,601, Jul. 16, 1979, abandoned. This application Apr. 16, 1981, Ser. No. 254,750

Int. Cl.³ F16D *25/08, 25/12*

U.S. Cl. 192—67 P **6 Claims**



1. Power transmission mechanism comprising:

(a) a longitudinally extensible and retractable driving shaft having an outer end portion including a longitudinally outwardly tapering coupling head and an inner end portion;

(b) a driven shaft having an inner end portion, an outer portion, and a universal joint connecting said outer end portion to said inner end portion;

(c) said inner end portions of said shafts being arranged to be connected, one to a prime mover for rotation, and the other to an apparatus to be driven;

(d) said outer end portion of said driven shaft comprising a longitudinally inwardly tapering coupling socket for interfitting reception of the tapered head of said first shaft;

(e) yielding means urging said inner and outer end portions of the driven shaft toward axial alignment with each other;

(f) and means for imparting extending and retracting movements to said driving shaft to move said head into and out of interfitting driving engagement with said socket,

wherein said coupling head has a generally circular cross-sectional configuration and a sprocket element having a

plurality of teeth is attached to the outer surface of the coupling head adjacent its widest end, and wherein said coupling socket has a generally circular cross-sectional configuration and at least one engagement finger extending from said coupling socket for reception between an adjacent pair of said teeth.

4,433,768

CLUTCH THROW-OUT

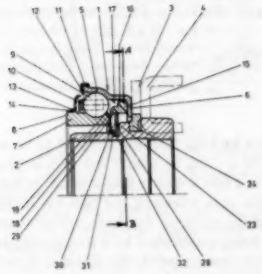
Armin Olschewski, Schweinfurt; Manfred Brandenstein, Eussenheim; Lothar Walter, and Heinrich Kunkel, both of Schweinfurt, all of Fed. Rep. of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Feb. 11, 1981, Ser. No. 233,399

Claims priority, application Fed. Rep. of Germany, Feb. 22, 1980, 8004784

Int. Cl.³ F16D *23/14*

U.S. Cl. 192—98 **6 Claims**



1. In a clutch throw-out, particularly for motor vehicle clutches, including a sliding sleeve and a self-centering clutch thrust-bearing having a bore, which thrust-bearing abuts in a radially shiftable manner against a pressure plate of the sliding sleeve, and having an elastic ring positioned with respect to said bore for damping the movements of said bearing in a circumferential direction, the improvement comprising providing said damping ring with a plurality of elastic tongues arranged in pairs and converging in an essentially radial direction, a plurality of protrusions arranged between said tongues and fixed with respect to said sliding sleeve, said tongues abutting with clearance against the lateral surfaces of said protrusions, a projection being formed out of said pressure plate and one of said radially directed protrusions lying against said projection with facing surfaces abutting, said projection being located with substantial clearance in a recess of said stationary bearing ring.

4,433,769

GRINDING MILL CONTROL SYSTEM

Serge L. Scuccato, Peterborough, and Marvin B. Shaver, Beaconsfield, both of Canada, assignors to Dominion Engineering Works Limited, Lachine, Canada

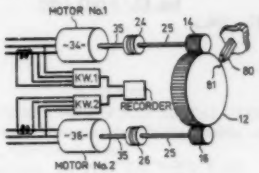
Continuation-in-part of Ser. No. 81,032, Oct. 1, 1979, abandoned. This application Jul. 24, 1981, Ser. No. 286,627

Claims priority, application Canada, Oct. 13, 1978, 313334

Int. Cl.³ B60K *41/02*; F16H *37/06*

U.S. Cl. 192—0.098 **4 Claims**

1. A mill drive system having a mill drum rotatably mounted between spaced bearings, a large gear connected thereto in driving relation, at least two pinion gears mounted in constant meshing relation with the large gear, at least two electric motors to drive the respective pinion gears, variable clutches to permit variation in transmission of torque between each motor and the respective pinion gear, and regulating means for selectively controlling the clutches, said system being subject while under steady state operation to recurrent cyclic imbalance in the instantaneous values of electrical power required by said motors, angular position indicating means located at a predetermined angular position on the large gear and datum indicating means positioned in predetermined angular relation



adjacent the large gear to provide indication of the coincidence of the indicating means, and clutch control means for effecting locking-up of the clutches at a preselected angular position of the gear wheel whereby the cyclic variation in load of the motors may be selectively moderated.

4,433,770

TORSIONAL DAMPERS

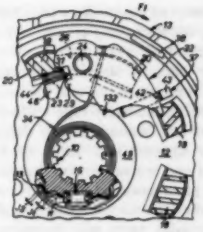
Pierre Loizeau, Ville D'Avray, and Roger Carmillet, Paris, both of France, assignors to Valeo, Paris, France

Filed Nov. 25, 1981, Ser. No. 324,843

Claims priority, application France, Dec. 2, 1980, 80 25527

Int. Cl.³ F16D *3/14*

U.S. Cl. 192—106.2 **10 Claims**



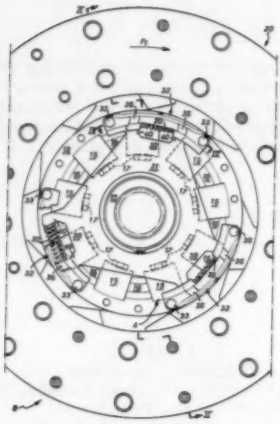
1. A torsional damper such as a friction clutch plate, comprising at least two coaxial parts mounted to rotate relative to one another within a defined range of relative angular movement, elastic means between said parts acting circumferentially over at least part of said defined range of relative angular movement so as to resist same, at least one intermediate member responsive to centrifugal force by modifying the operating characteristics of the damper over at least part of said range of relative angular movement through its reversible movement against the action of return means between a standby position, which it occupies for a first range of relatively low rotational speeds of the damper assembly, and at least one operative position, which it occupies at relatively high rotational speeds of the damper assembly, said intermediate member modifying the operating characteristics of the damper in said standby position and having no effect thereon in the or each of said operative positions.

4,433,771

TORSION DAMPING DEVICE FOR A CLUTCH PLATE

Andre Caray, Paris, France, assignor to Valeo S.A., Paris, France

Filed Jul. 14, 1981, Ser. No. 283,284
Claims priority, application France, Jul. 15, 1980, 80 15598
Int. Cl.³ F16D 3/66
U.S. Cl. 192—106.2 15 Claims



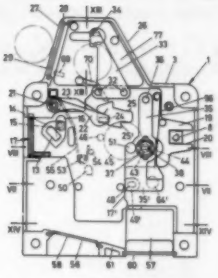
1. A torsion damping device for a clutch plate assembly, said torsion damping device having an axis and comprising a common hub and separate first and second torsion damping stages, the first torsion damping stage comprising a relatively low stiffness torsion damping means and the second torsion damping stage comprising relatively high stiffness torsion damping means, said first and second torsion damping means being arranged axially adjacent each other on said common hub, each of said first and second torsion damping means comprising two coaxial parts mounted for relative angular movement and a plurality of elastic members interposed circumferentially between said coaxial parts and opposing relative angular movement thereof, said elastic members of said first damping stage being arranged in a first circumferential array about the axis of said torsion damping device and said elastic members of said second damping stage being arranged in a second circumferential array about the axis of said torsion damping device, the diameter of said first array being greater than that of said second array, one of said coaxial parts of said first damping stage being in the form of transvere flange fixed for rotation with said common hub and a plurality of pairs of separate part-annular guide plates respectively accommodating said elastic members, said pairs of guide plates being fixed for rotation with each other and with one of said coaxial parts of said second damping stage, the other of said coaxial parts of said second damping stage being in engagement with play with said common hub, said pairs of guide plates extending circumferentially to both ends of their associated elastic members, and axially outer guide plates defining with said common hub an axially outwardly opening annular recess.

4,433,772

LOCK WITH LOCKING FUNCTION ADAPTED TO BE ACTUATED AFTER THE INSERTION OF A COIN

Armin Eisermann; Heinz T. Eicken, and Diethard Geiger, all of Velbert, Fed. Rep. of Germany, assignors to Schulte-Schlagbaum AG, Velbert, Fed. Rep. of Germany

Filed May 21, 1982, Ser. No. 380,503
Claims priority, application Fed. Rep. of Germany, Jun. 19, 1981, 3124180
Int. Cl.³ G07F 5/02
U.S. Cl. 194—59 14 Claims



1. In a lock with a locking function adapted to be actuated after the insertion of a coin, in which the coin drops into a supported position in a bolt which is displaceable by key actuation, the edge of the coin releasing the bolt for locking displacement to a locking position by disengaging a pawl, the supported position being established by a first resting point on the bolt and a second resting point, the distance between the two resting points being variable as a function of the locking displacement of the bolt, the improvement wherein

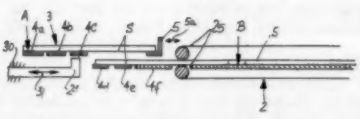
the second resting point is formed by a projection member having an eccentrically shaped end portion, said projection member being seated on a lever pivoted to the bolt, such that upon the locking displacement of the bolt, the lever pivots into a position wherein the distance between the eccentrically shaped end portion and the first bolt resting point is increased, the projection member including an attack surface facing a rear wall of the lock for engagement with a conversion tool.

4,433,773

APPARATUS FOR MANIPULATING STACKS OF PAPER SHEETS OR THE LIKE

Paul Jendrusch, Hamburg, Fed. Rep. of Germany, assignor to E.C.H. Will (GmbH & Co.), Hamburg, Fed. Rep. of Germany

Filed Jan. 6, 1982, Ser. No. 337,426
Claims priority, application Fed. Rep. of Germany, Jan. 10, 1981, 3100583
Int. Cl.³ B65G 37/00
U.S. Cl. 198—467 18 Claims



1. Apparatus for manipulating a series of flat articles, such as closely adjacent flexible stacks of paper sheets, comprising a feeding unit including first conveyor means for advancing the articles of said series in a first direction and along a first path; a removing unit including second conveyor means for advanc-

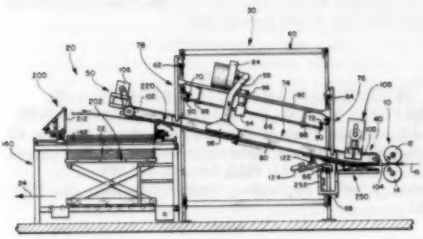
ing successive articles of said series in a second direction and along a second path located at a level below said first path; and means for transferring successive articles of said series from said first into said second path, including a table having a succession of sections disposed one behind the other, as considered in said second direction, and movable between upper positions in which they are located at the level of said first path and support from below an article supplied by said feeding unit and lower positions in which the article thereon is located at the level of said second path, means for moving said sections including means for simultaneously lowering said sections from said first to said second positions and for individually lifting the sections of said succession from said lower positions to said upper positions as soon as an article which is supported by said sections during movement to said lower positions is advanced along said second path beyond a section, and means for temporarily supporting portions of successive articles in said first path during advancement of such articles into the range of said sections, said moving means further comprising discrete sensors, one for each of said sections and each arranged to generate signals denoting the presence or absence of an article on top of the respective section, said lifting means including devices which are actuatable in response to signals from said sensors to move a section back to the upper position when the signal from the respective sensor indicates that the article which has been lowered by said sections is advanced beyond the corresponding section.

4,433,774

BLANK CONVEYOR APPARATUS

Richard R. Lopes, Salem, Wis., assignor to Stone Container Corporation, Chicago, Ill.

Filed Mar. 13, 1981, Ser. No. 243,358
Int. Cl.³ B65G *47/91*
U.S. Cl. 198—689 **8 Claims**



1. An improved conveyor system for conveying die cut blanks from a rotary die cutter to a blank stacking device, said conveyor system comprising:

vacuum belt conveyor means for suspending and transporting blanks from the rotary die cutter to the blank stacking device, said conveyor means comprising a perforated belt, means for translationally moving the belt, and means for generating a subatmospheric pressure on one side of the belt such that blanks brought into contact with the other side of the belt are held against the belt by atmospheric pressure, said conveyor means having a blank take-up section and a blank release section; and

means for positioning the conveyor means between the rotary die cutter and the stacking device such that the blank take-up section is adjacent the die cutter, the blank release section is adjacent the stacking device, and the perforated belt of the conveyor means operates automatically to engage blanks before they have been released by the die cutter, to retain blanks in registry as they are transported to the stacking device, and then to release the in-registry blanks to the stacking device;

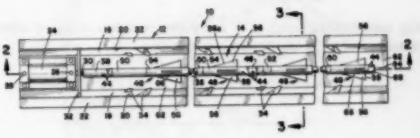
said positioning means further comprising a frame positioned between the die cutter and the blank stacking device, and first means, mounted to slide along the frame and secured to the conveyor means adjacent the blank take-up section, for mounting the blank take-up section of the conveyor means to the frame.

4,433,775

PUSHER ASSEMBLY FOR SCRAP METAL CONVEYORS

Barry S. Hollowell, Warrensville Heights, Ohio, assignor to Mayfran, Inc., Cleveland, Ohio

Filed May 18, 1981, Ser. No. 265,037
Int. Cl.³ B65G *25/00*
U.S. Cl. 198—742 **10 Claims**



1. A pusher assembly for a scrap metal conveyor having a trough including bottom wall means on which the pusher assembly is supported for longitudinal reciprocation to advance scrap metal along the trough between opposite ends thereof and means at one end of said trough to reciprocate said pusher assembly, said pusher assembly comprising rigid push rod means extending longitudinally along said trough, said push rod means being circular in cross-section and having an axis, a plurality of axially spaced apart scrap metal pusher means each supported on said push rod means for reciprocation therewith and against axial displacement relative thereto and for swinging circumferential pivotal movement relative to one another and to said push rod means, said swinging movement being restricted to a plane transverse to said axis, each said pusher means including pusher blade means and a tubular support sleeve for said blade means, spacer sleeve means between the support sleeves of axially adjacent ones of said pusher means and providing said axially spaced apart relationship therebetween, said support sleeves and said spacer sleeve means being axially slidably received on and removable from said push rod means, and means releaseably retaining said support sleeves and said spacer sleeve means on said push rod means.

4,433,776

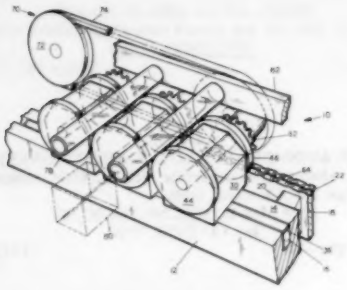
DRIVEN ROLLER TUBE CONVEYOR

Ralston G. Edwards, Jr., Newfield; John R. B. Walkden; Walter H. Carstensen, both of Vineland; Gregory E. Murphy, Erial, and John E. Lisi, Newfield, all of N.J., assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Jul. 6, 1981, Ser. No. 280,579
Int. Cl.³ B65A *17/24*
U.S. Cl. 198—779 **16 Claims**

1. A roller conveyor comprising, in combination, a plurality of rollers supported for rotation about parallel, spaced-apart axes, means for translating said rollers along an axis generally perpendicular to said spaced-apart axes, means for driving said rollers at a reference surface speed, and means operably disposed intermediate said drive means and said rollers for rota-

tionally coupling said rollers to said drive means upon relative rotation therebetween in one direction and rotationally releasing said rollers from said drive means upon relative rotation therebetween in the opposite direction.

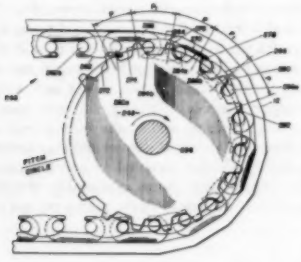


4,433,777

CONVEYOR BELT DRIVE SPROCKET

Neal W. Densmore, Franklin, Pa., assignor to Joy Manufacturing Company, Pittsburgh, Pa.

Division of Ser. No. 80,760, Oct. 1, 1979, Pat. No. 4,339,031.
This application Dec. 23, 1981, Ser. No. 333,594
Int. Cl.³ B65G *23/06*
U.S. Cl. 198—834 1 Claim



1. In an elongated conveyor having an orbital material conveying belt of the type comprising an elongated web of resilient material and a chain attached to and extending along the longitudinal length of said web, said belt extending between and about rotatable means disposed at opposite ends of said belt for maintaining said belt in tension and driving same, the improvement comprising:

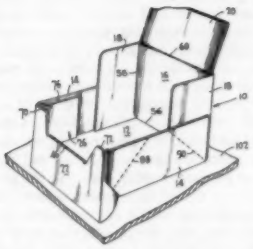
at least one of said rotatable means including a drive sprocket having alternating space teeth in a plurality of sets thereof, each of said teeth having a leading drive surface engaging said chain, each set including first and second teeth being spaced a given distance from each other on a pitch circle defined about said sprocket and with the second and third teeth being spaced a distance less than said given distance whereby upon engagement of said teeth with said chain adjacent links of said chain are moved closer together to thereby relieve some of the increased tension in said belt caused by the chain passing around said sprocket.

4,433,778

AUTOMATIC TILT DISPLAY CARTON

Patrick S. Maio, Ringwood, and John F. Lee, Vernon, both of N.J., assignors to Federal Paper Board Co., Inc., Montvale, N.J.

Filed Sep. 17, 1982, Ser. No. 419,163
Int. Cl.³ B65D *5/20*
U.S. Cl. 206—45.25 17 Claims



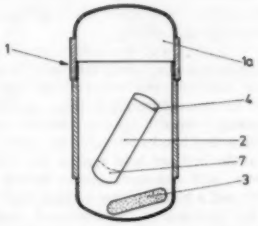
1. An automatic tilt display carton comprising a bottom wall, side walls extending upwardly from side edges of said bottom wall, and a first end wall connected to a first edge of said bottom wall, said end wall extending below said bottom wall and including a connecting panel directly depending from said bottom wall first edge, said first end wall having connecting flaps extending from opposite edges of said first end wall and secured to adjacent portions of said side walls wherein in the erected state of said carton said first edge of said bottom wall is elevated and said bottom wall tilts towards a second edge of said bottom wall, and a second end wall connected to said second edge of said bottom wall.

4,433,779

DENTIST'S APPARATUS FOR STORING AND VIBRATION MIXING OF AMALGAM COMPONENTS

Alfred Schmid, Jr.; Hans Müller, and Alexander P. Jaecklin, all of St. Gall, Switzerland, assignors to Coltene AG, Switzerland

Filed Jan. 11, 1983, Ser. No. 457,159
Claims priority, application Switzerland, Jan. 19, 1982, 304/82
Int. Cl.³ B65D *25/08*
U.S. Cl. 206—220 18 Claims



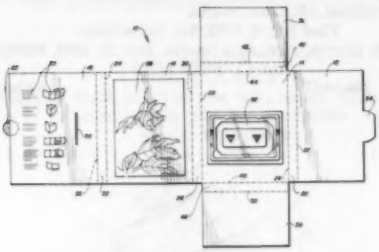
1. A capsule for storing and vibration mixing of two component materials for dental application, comprising a mixing space which contains a first component and a pestle, the pestle being in the form of a hollow body which contains a second component, the hollow body being provided with a cover which is attached to the hollow body, the pestle includes at least one opening which permits exit of said second component into the mixing space, and said opening being rendered passable as a result of a mixing vibration movement.

4,433,780

GREETING CARD

Karen E. Ellis, 8012 S. Drexel, Chicago, Ill. 60619

Filed Nov. 16, 1981, Ser. No. 321,390
Int. Cl.³ B65D *85/00, 85/672, 73/00*
U.S. Cl. 206—232 1 Claim



1. A greeting card in the form of a folded rectilinear box which comprises:

a foldable member formed of cover stock and carrying thereon means for receiving an audio cassette;

said receiving means comprising a receptacle having a configuration that is complementary to the configuration of a standard audio cassette for snugly receiving a standard audio cassette;

said receptacle being connected to said foldable member in a location whereby when the foldable member is folded, said receptacle being enclosed within said rectilinear box;

said rectilinear box being formed from said foldable member comprising a first panel, a second panel, a third panel and a fourth panel; the first panel being separated from the second panel by a first intermediate portion defined by two fold lines; said second panel being separated from the third panel by a second intermediate portion defined by two fold lines; said fourth panel being separated from the third panel by a third intermediate panel defined by two fold lines; a pair of flaps extending outwardly from said second panel, each of said flaps being separated from said second panel by a portion defined by two fold lines;

means for connecting said first panel to said fourth panel;

said foldable member also being formed into an upstanding display-type structure when it is folded in a direction that is opposite to the direction of folding to form said rectilinear box and when said first panel is connected to said fourth panel.

4,433,781

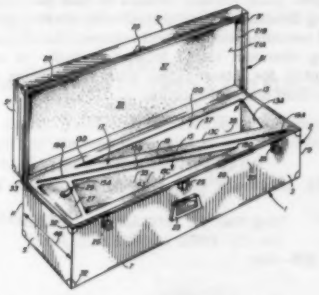
COMPACT DUAL BELL SECTION TROMBONE CASE

Donald A. Hummel, P.O. Box 1329, Wickenburg, Ariz. 85358

Filed Sep. 27, 1982, Ser. No. 424,640
Int. Cl.³ A45C *11/00*
U.S. Cl. 206—314 12 Claims

1. A trombone case comprising in combination:

a body section including first and second padded generally triangular compartments for storing first and second bell sections, respectively, a base end portion of said first generally triangular compartment receiving and snugly engaging an enlarged flared horn end portion of said first bell section, a generally pointed end portion of said first generally triangular compartment receiving and snugly engaging a narrowed tubular portion of said first bell section opposite to the enlarged flared horn portion thereof, a base end portion of said second generally triangular compartment receiving and snugly engaging an enlarged flared portion of said second bell section, and a generally pointed end portion of said second generally triangular compartment receiving and snugly engaging a narrowed tubular portion of said second bell section opposite to the enlarged flared horn portion thereof, the base end portion of said first generally triangular compartment being adjacent to the pointed end portion of said second generally triangular compartment, and the base end portion of said second generally triangular compartment being adjacent to the pointed end portion of said first generally triangular compartment so that outer walls of said first and second generally triangular compartments approximately coincide with the sides of a parallelepiped, the distance between a front wall and a rear wall of said trombone case being substantially less than twice the width of the base end portion of either of said first and second generally triangular compartments;



a well section bounding at least one of said first and second generally triangular compartments, said wall section having an elongated padded groove therein for receiving and snugly engaging a slide section which mates with either of said first and second bell sections, wherein said wall section having said elongated padded groove therein is diagonally disposed between said first and second generally triangular compartments and serves as a wall for each of said first and second generally triangular compartments; and

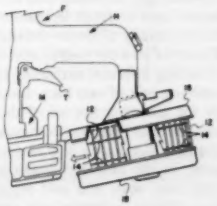
a cover section closeable on said body section to enclose said first and second generally triangular compartments, said cover section having a padded interior surface.

4,433,782

MAGAZINE ASSEMBLY FOR COIL NAILS

Siegfried E. O. Figge, Newmarket, and Herbert E. Leistner, Toronto, both of Canada, assignors to Sigma Tool & Machine Limited, Scarborough, Canada

Filed Sep. 29, 1982, Ser. No. 427,659
Claims priority, application Canada, Oct. 20, 1981, 388320
Int. Cl.³ B65D *85/24*
U.S. Cl. 206—338 10 Claims



1. A magazine for use in association with a fastener driving tool of the type employing fasteners associated together in a strip formed into a coil, such a magazine comprising;

a fixed portion adapted to be fastened to such a fastener driving tool;

wall means forming a portion of said fixed portion for engaging said coil of fasteners;

a mounting member associated with said fixed portion and extending along an axis centrally of a said coil of fasteners;

a movable attachment member incorporated in said mounting member, and movable between locking and releasing positions, and in said locking position, extending outwardly with respect to said mounting member;

a movable magazine portion defining wall means adapted to engage a said coil of fasteners;

exit means on at least one of said fixed and movable magazine portions, for permitting exit of said fastenings as they are withdrawn from said magazine;

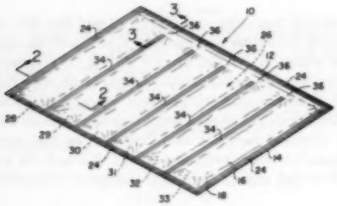
a slidable guide member formed on said movable portion, being dimensioned and shaped to be interengageable with said mounting member, and removed therefrom, and,

locking abutment means located inwardly of said guide member, for interengaging with said locking means on said fixed magazine portion.

4,433,783
SOAP POWDER PACKAGE

Robert H. Dickinson, 1132 Winding Dr., Cherry Hill, N.J. 08034

Filed Dec. 17, 1979, Ser. No. 104,039
Int. Cl.³ B65D *27/08, 85/00, 30/22*
U.S. Cl. 206—484 **1 Claim**

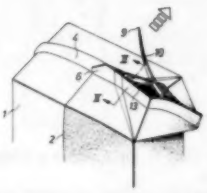


1. A rupture-proof package formed of paper construction material for soap powder comprising a cooperating pair of front and rear rectangular panels presenting opposite long and short dimensioned sides arranged in superposed relation and having heat sealable surfaces in facing relation to each other, a rectangular peripherally applied heat seal for joining said front and rear panels to each other so as to bound therebetween a correspondingly rectangularly shaped storage compartment for a layer of soap powder having an operative interposed position therebetween prior to the application of said peripheral heat seal, and five position-retaining heat seals additionally joining said front and rear panels to each other applied in spaced apart relation along said long dimension of said package so as to correspondingly delineate said compartment into six sub-compartments each oriented lengthwise in said short dimension thereof to thereby minimize the shifting concentration of said stored layer of powder within said compartment, each said position-retaining heat seal extending in spanning relation between an opposing pair of said long dimensioned peripheral heat seals only for most but not all of the distance therebetween to thereby form at least one communicating air passage extending in the long dimension of said package between said sub-compartments in the unsealed distance left between said position-retaining heat seals and said peripheral heat seal in adjacent position thereto, whereby any external pressure applied against any air trapped in said package during the sealed enclosure of said soap powder is merely displaced to another location rather than contributing to the rupture of said package and any select number of less than said six sub-compartments are adapted to be opened for removal of the contents therefrom by merely severing said package in said long dimension thereof in said unsealed distance and for an extent corresponding to said select number of sub-compartments.

4,433,784
ARRANGEMENT ON PACKING CONTAINERS

Tom Kjelgaard, Löddeköpinge, Sweden, assignor to Tetra Pak International AB, Lund, Sweden

Filed Dec. 6, 1982, Ser. No. 446,941
Claims priority, application Sweden, Dec. 30, 1981, 8107861
Int. Cl.³ B65D *17/48*
U.S. Cl. 206—617 **6 Claims**



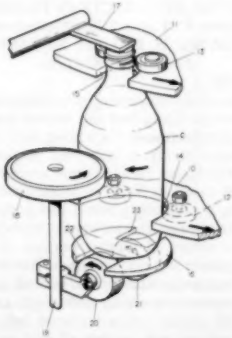
1. An opening arrangement for a packing container of the type having a sealing fin extending over a top end wall, the sealing fin including two adjoining sheets of a packing material covered with a plastic covering on at least their facing surfaces, the opening arrangement comprising:

a strip inserted between the adjoining sheets of the sealing fin along at least a portion of the sealing fin, said strip including a central layer and two outer layers of a plastic material similar to the plastic covering on each sheet of the packing material, said outer layers of said strip being sealed to the plastic covering of each sheet, an adhesive force between said central layer of said strip and said outer layers of said strip being weaker than an adhesive force between said outer layers of said strip and the plastic covering of each sheet to enable said central layer to be pulled away to open the packing container.

4,433,785
LEANER GAUGE FOR NARROW NECK CONTAINERS

Darius O. Riggs, Ottawa Lake, Mich., and Thomas B. Sorbie, Toledo, Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Jun. 24, 1981, Ser. No. 276,770
Int. Cl.³ B07C *5/00*
U.S. Cl. 209—531 **11 Claims**

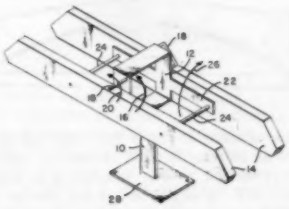


1. Method of measuring the plane of the bottom of a glass container relative to its vertical axis comprising:

sliding a container sideways over a slide plate into a gauging position;

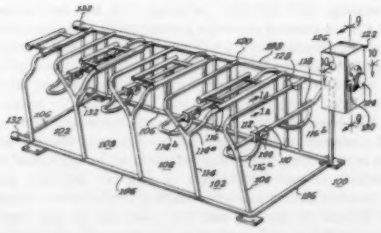
holding the container in light contact with the slide plate during movement thereof;
rotating the container about its vertical axis;
sensing the relative height of the bottom of the bottle at diametrically opposed points as it is rotated; and
rejecting containers whose bottoms are non-normal to their vertical axis a predetermined amount.

4,433,786
BICYCLE RACK
Timothy T. Wahl, 6732 13th Ave. NW., Seattle, Wash. 98117
Filed Apr. 30, 1981, Ser. No. 258,921
Int. Cl.³ E05B 73/00
U.S. Cl. 211—5 **12 Claims**



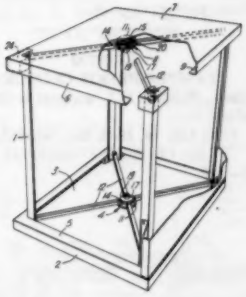
1. A rack to which a bicycle may be conveniently locked while the bicycle and its finish are protected, comprising:
(a) a support projecting upwardly from the ground;
(b) two elevated wooden panels attached to the support, laterally spaced to straddle the support, and extending substantially parallel to one another at least as far as the distance between the fork and seat-stay of the bicycle; and
(c) a locking loop rigidly affixed on each side of the support capable of receiving a lock used to secure a bicycle, wherein (1) the bicycle is lockable to the rack so that the wheels of the bicycle extend substantially parallel to the panels and adjacent to the panel, and (2) the panels are sufficiently spaced so that bicycles may be simultaneously locked without interference adjacent both panels, further comprising at least one support rod extending between the panels and defining another locking loop defined by the support, a section of one panel, the rod, and a section of the second panel.

4,433,787
COIN OPERATED BICYCLE LOCKING RACK
Steven F. Cook, 6646 N. Clark, Chicago, Ill. 60626, and Glen E. Burlingame, 2858 W. 55th Street, Chicago, Ill. 60632
Filed Jun. 5, 1981, Ser. No. 270,967
Int. Cl.³ E05B 73/00
U.S. Cl. 211—5 **15 Claims**



1. A coin operated locking bicycle rack comprising:
a plurality of stalls having first and second sides for receiving bicycles therebetween;
a plurality of arms being mounted to said first sides of said stalls and being adapted to selectively traverse the stalls to engage bicycles positioned within said stalls;
a plurality of locking means being mounted to said second sides of said stalls for receiving and locking said arms in a bicycle securing position wherein said arms traverse said stalls; and
centrally located stall control means for selecting an unoccupied stall and including coin responsive means for enabling the operation of said stall control means to release the locking means of said selected stall and accordingly said selected stall whereby a bicycle can be inserted and locked thereinto by said selected stall locking means.

4,433,788
ENCLOSURES FOR ELECTRICAL AND ELECTRONIC EQUIPMENT
David P. Erlam, Winchester, and Thornton N. J. Archard, Epsom, both of England, assignors to BICC Public Limited Company, London, England
Filed Apr. 24, 1981, Ser. No. 257,149
Int. Cl.³ A47F 7/00
U.S. Cl. 211—26 **14 Claims**

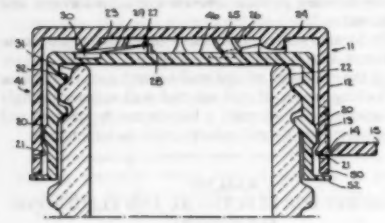


1. A skeleton frame for a fabricated structure for housing electrical equipment, which skeleton frame comprises at least three substantially rigid upstanding elongate members which are arranged at spaced positions around the periphery of the frame and which are secured together at each of at least two positions spaced along their lengths wherein, at at least one of said positions the upstanding elongate members are secured together by an endless flexible band of metal or metal alloy which surrounds the members and is maintained in tension by at least one bracing device positioned between the elongate members and comprising a central hub, a plurality of substantially rigid, elongate bracing members extending radially outwardly from the hub and each engaging one of the upstanding elongate members, and adjustable means urging the bracing members outwardly in the directions of their lengths to maintain the endless band under such a tension that the frame is held substantially rigid.

4,433,789
CONVERTIBLE CHILD RESISTANT CLOSURE
Kenneth J. Gibilisco, Warminster, Pa., assignor to Merck & Co., Inc., Rahway, N.J.
Filed Dec. 20, 1982, Ser. No. 451,502
Int. Cl.³ B65D 55/02
U.S. Cl. 215—220 **8 Claims**

1. In an improved child resistant two-piece closure for containers having inner and outer cap members, said inner and outer cap members allowing relative rotatory and axial movement between said inner and outer members and having flexi-

ble means and ratchet drive means attached to the inner surface of said outer cap member and/or the outer surface of said inner cap member to maintain said members in axial position two to allow rotation of said outer cap without imparting motion to said inner cap in the loosening direction but causing engagement of the ratchet drive means in the tightening direction and



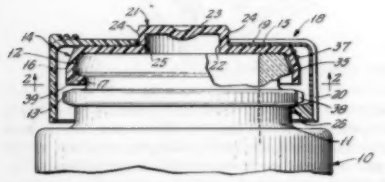
means for locking said inner and outer cap members in axial position one, thereby permitting removal of said closure by rotation in the loosening direction, the improvement which comprises provision of a means for removing said outer cap member without removing said inner cap member thereby converting said two piece child resistant closure into a one piece non-child resistant closure.

4,433,790

TAMPER-PROOF CLOSURE

Royal H. Gibson, Rumson, N.J., assignor to Gibson Associates, Inc., Cranford, N.J.

Filed Feb. 18, 1983, Ser. No. 467,817
Int. Cl.³ B65D *41/02, 41/32*
U.S. Cl. 215—246 **16 Claims**



1. As an article of manufacture, a cup-shaped container-closure cap having a cylindrical skirt and a closure end, a frangible cover surrounding the closed end and skirt of said cap, and interengaged means on said cover and cap retaining their assembled relation, said cap and said cover each being of stiffly yieldable plastic material, radially inward container-bead engaging means integrally formed with said skirt at the open end of said cap, said frangible cover being circumferentially continuous at least in a region axially beyond the open end of said skirt, and radially inward container-bead engaging means integrally formed with said cover at said circumferentially continuous region.

4,433,791

PRESSURE RELIEF DEVICE FOR INTERNALLY PRESSURIZED FLUID CONTAINER

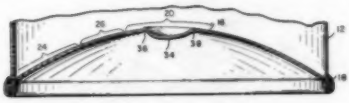
Walter J. Mulawski, Chelmsford, Mass., assignor to Sexton Can Company, Inc., Everett, Mass.

Continuation of Ser. No. 169,404, Jul. 16, 1980, abandoned. This application Dec. 3, 1981, Ser. No. 327,200
Int. Cl.³ B65D *51/16, 83/14*
U.S. Cl. 220—89 A **7 Claims**

1. A pressure release device for an internally pressurized fluid container of the type having a tubular side wall, said device comprising:

a dome-shaped inwardly concave closure element circumferentially joined to one end of said side wall, said closure element being deep drawn of tempered steel, with a circular central area spaced from an annular outer area by an annular intermediate area traversed by radially extending Lüders Lines,

a dome-shaped outwardly convex tab member in said central area, said tab member being partially circumscribed by a single weakened line of reduced material thickness, said line lying on a circle, with the ends of said line being separated by a connecting area of substantially undisturbed material thickness and strength,



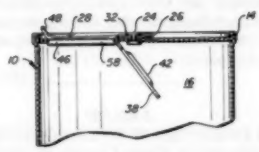
said closure element having a structural integrity which reacts to an increase in fluid pressure in said container above a prescribed level by undergoing at least a partial eversion which initially occurs at said annular outer area and thereafter progresses across said annular intermediate area into said circular central area to initiate a fracture of the closure element along said weakened line of reduced material thickness by pulling the opposite sides of said line apart, with the said connecting area remaining intact during any resulting outward deflection of the tab member occasioned by fluid escaping from said container through said fracture.

4,433,792

OPENING AND STOPPER DEVICE

George Mandel, 62 Long View Ct., Danville, Calif. 94526

Filed Sep. 29, 1982, Ser. No. 427,500
Int. Cl.³ B65D *17/34*
U.S. Cl. 220—269 **7 Claims**



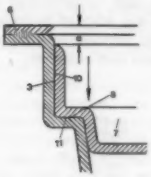
1. In a container having a aluminium top with a tab opening mechanism engaging a scored flap in said top for forming a contents dispensing aperture, the improvement comprising; a resealing means on said tab opening machanism for hermetically resealing said aperture, wherein said tab mechanism includes a pivot element centrally connected to said aluminium top and a tab member having a finger lift portion and a detent edge, said tab member being pivotally connected to said pivot element between said finger left portion and said detent edge, said detent edge being directed at said scored flap for separating said flap from said aluminium top and depressing said flap into said container on lifting said lift portion and, wherein said resealing means comprises a stopper member incorporated on the underside of said lift portion of said tab member, said stopper member having a configuration complimentary to said aperture formed on opening said container said stopper member being inserted in said aperture by pivoting said tab member to locate said stopper member over said aperture and depressing said lift portion of said tab member.

4,433,793

CONTAINER HAVING FRANGIBLE OPENING MEANS

Ole Ingemann, Svendborg, Denmark, assignor to A/S Haustrup Plastic, Langeskov, Denmark

Continuation of Ser. No. 210,896, Nov. 28, 1980, Pat. No. 4,332,332. This application Mar. 10, 1982, Ser. No. 356,892
Claims priority, application Sweden, Dec. 17, 1979, 79103620
Int. Cl.³ B65D 17/40
U.S. Cl. 220—276 18 Claims



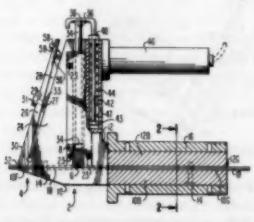
1. A container construction comprising a container body adapted for containing a product and including an annular wall and an annular flange extending outwardly from said wall at an upper edge thereof, said container body defining an open mouth within said wall, openable closure means closing said open mouth for sealing the product in said container body, said closure means comprising a lid including an annular wall engaged within the annular wall of said container body and an annular flange extending outwardly from said annular wall of the lid adjacent the annular flange of the container body, and sealing means including a continuous, annular seal sealably and permanently connecting said annular flange of the container body with said annular flange of the lid to seal the product within the container body, said lid including an annular failure zone located radially inwards of said sealing means in a position in which the failure zone can be ruptured by application of force to said lid to separate the flange of the lid from the remainder of the lid whereupon said flange of the lid remains secured to the flange of the container body and said remainder of the lid is removable from the container body to gain access to the product in said container body, said remainder of the lid being thereafter insertable into said container body to close the same by re-engaging the annular wall of the lid with the annular wall of the container body, the disposition of said annular failure zone with respect to said sealing means and of said lid and container body being such that rupture of said failure zone is effected by relatively displacing said lid with respect to said container body whereafter said lid is removable from said container body by pulling said lid out of said body.

4,433,794

JIG FOR MACHINING STYLUS BLANKS

Yashaya Yarnitsky, and Shmuel Kaldor, both of Haifa, Israel, assignors to RCA Corporation, New York, N.Y.

Filed Jul. 21, 1981, Ser. No. 285,620
Int. Cl.³ B65G 61/00
U.S. Cl. 221—224 11 Claims



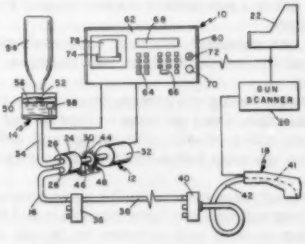
1. A jig for use in machining blanks comprising:
a housing having a front end, a feed channel, and a storage channel, said feed channel extending to the front end and said storage channel communicating with the feed channel;
a releasable gripping means located at the front end of said housing for gripping and releasing blanks transported to said releasable gripping means, said releasable gripping means including a deformable region of the housing integrally formed adjacent the front end thereof, wherein a section of the housing forms a fixed first jaw and the deformable region forms a movable second jaw, the first and second jaws being aligned with each other to form a vise; and
means disposed partly within said housing for transporting individual blanks from the storage channel through the feed channel to the releasable gripping means.

4,433,795

LIQUID METERING AND DISPENSING SYSTEM

Romaine R. Maiefski, 1035 Golden Rd., Encinitas, Calif. 92024, and Albert J. Puglisi, Escondido, Calif., assignors to Romaine R. Maiefski, Encinitas, Calif.

Filed Jul. 31, 1981, Ser. No. 289,112
Int. Cl.³ B67D 5/30
U.S. Cl. 222—14 18 Claims

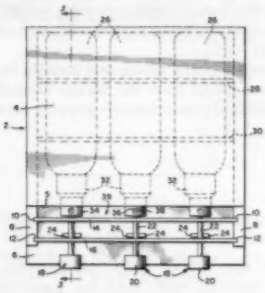


1. A system for metering and dispensing liquid from a reservoir through a dispenser connected to the remote end of a flow line comprising:
positive displacement pump means for receiving the liquid through a pump inlet and discharging a predetermined minute volume of the liquid through a pump outlet connected to the other end of the flow line for each predetermined amount of movement of a pump element;
means for connecting the reservoir to the pump inlet;
motor means for driving the pump means;
input means for enabling an operator to select a desired pour size volume equal to or greater than the predetermined minute volume and for commanding the dispensing of the selected pour size volume;
feedback control means for dispensing the selected pour size volume of the liquid through the dispenser in response to a command to the input means by energizing the motor means, counting the number of times that the pump element moves the predetermined amount, and de-energizing the motor means when the count indicates that the pump means has discharged the selected pour size volume of the liquid;
means for monitoring the quantity of liquid in the reservoir;
means for generating a restock signal to notify the operator when the reservoir is empty; and
means for inhibiting energization of the pump means upon receiving the restock signal.

4,433,796
FRAGRANCE OR THE LIKE DISPENSER, PARTICULARLY FOR AUTOMOBILES

Kenneth E. Brooks, Jr., 5047 Dry Well Ct., Columbia, Md. 21045

Filed Aug. 6, 1981, Ser. No. 290,719
Int. Cl.³ B67D *5/52*
U.S. Cl. 222—135 **8 Claims**



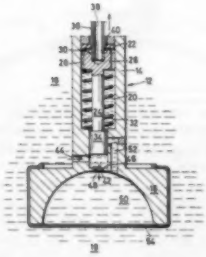
1. A dispenser mounted in an automobile, and comprising:
a housing having a base secured substantially horizontally in the automobile, a lid spaced above said base, and a front wall mounted on said base with the upper edge of said front wall being spaced forwardly of the front edge of said lid to define a substantially horizontal aperture between said edges;
at least one elongated container supported substantially horizontally in said housing and having a fragrance therein;
said container having valve means depressable in the lengthwise direction of said container to dispense said fragrance from an orifice of said valve means, said orifice being directed upwardly below and in register with said aperture;
a movable actuating member having a part passing through said front wall, said part being movable in said lengthwise direction towards said container to depress said valve means to cause a spray of said fragrance to discharge upwardly through said aperture into the interior of said automobile; and
said housing having a second front wall spaced from said first mentioned front wall, and said movable actuating member passing through said second front wall.

4,433,797
METERED QUANTITY DISPENSING VALVE

Karl Galia, Oehningen, Fed. Rep. of Germany

Division of Ser. No. 150,694, May 16, 1980, abandoned. This application Sep. 8, 1981, Ser. No. 300,277
Claims priority, application Fed. Rep. of Germany, May 21, 1979, 2920497; Nov. 20, 1979, 2946814
Int. Cl.³ B65D *83/14*
U.S. Cl. 222—207 **9 Claims**

1. A valve assembly for dispensing a metered quantity of a flowable product from a container having a pressurized interior ambient, said valve assembly when installed in said container comprising:
A. a valve body having a discharge portion extending out of said container, and a main body portion residing within said pressurized ambient;
B. said valve body defining a primary flow passage extending through from said discharge portion to said main body portion, enabling said flowable product to be expelled from said container;
C. spring biased discharge valve means positioned within said discharge portion to release said flowable product from said container;
D. product metering container means positioned within said pressurized interior ambient, in fluid registry with said main body portion, having a metering chamber adapted to hold a predetermined quantity of said flowable product, said metering chamber defined by a member having a rigid concave inner wall and a resilient wall positioned over said concave inner wall in fluid-tight engagement with said member about the entire outer boundary of said concave inner wall, said resilient wall exposed to said pressurized ambient and adapted to collapse against said concave inner wall in response to fluid pressure to expel flowable material from said chamber;

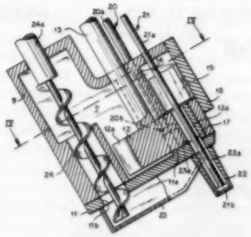


E. a secondary flow passage connecting said metering chamber and said primary flow passage;
F. a tertiary flow passage providing a fluid inlet to said chamber from said pressurized interior ambient; and
G. a second flow-switching valve means positioned in communication with said product metering container means, actuated in response to the operation of said discharge valve means, to prevent ingress of said flowable product from said pressurized interior ambient into said chamber when said discharge valve means is positioned to enable the expulsion of said flowable product out of said chamber and said container to occur.

4,433,798
VOLUMETRIC DOSING APPARATUS FOR PARTICULATE MATTER

Andrea Romagnoli, San Lazzaro di Savena, Italy, assignor to Industria Macchine Automatiche, Bologna, Italy

Filed Jan. 21, 1982, Ser. No. 341,170
Claims priority, application Italy, Jan. 23, 1981, 3314 A/81
Int. Cl.³ B67D *5/52*
U.S. Cl. 222—255 **8 Claims**



1. An apparatus for volumetrically dosing particulate matter, comprising:
a housing divided by an internal partition into a supply compartment and a discharge compartment;
hopper means communicating with said supply compart-

ment for keeping same partly filled with a mass of particles to be dispensed;

a dosing drum disposed in said housing near the bottom thereof and rotatable about a generally vertical axis, said dosing drum having a plurality of angularly equispaced peripheral notches of constant transverse cross section which are open to upper and lower faces and to the circumference of said drum so as to be entirely occupied by particles of a surrounding mass, said drum lying partly in said supply compartment and extending into said discharge compartment with a sectoral portion encompassing two of said notches, said discharge compartment having an arcuate wall in contact with the periphery of said sectoral portion;

drive means coupled with said drum for intermittently rotating same in steps equaling the pitch of said notches, thereby successively arresting an incoming notch in a first and in a second position in said discharge compartment, said housing being provided with an overflow outlet and with a dosing outlet respectively underlying a notch of said drum in said first and said second position thereof;

a first plunger reciprocable parallel to said axis in said discharge compartment above said overflow outlet and coupled with said drive means for entering a notch in said first position from above and descending therein to a predetermined level with resulting expulsion of a certain fraction of the contents of the notch into said overflow outlet; and

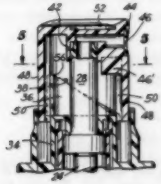
a second plunger reciprocable parallel to said axis in said discharge compartment above said dosing outlet and coupled with said drive means for entering a notch in said second position from above and passing completely therethrough to eject the remaining contents of the notch into said dosing outlet.

4,433,799

LIQUID DISPENSING PUMP ARRANGEMENT WITH SELECTIVE STROKE RESTRICTION

Douglas F. Corsette, Los Angeles, Calif., assignor to Calmar, Inc., Watchung, N.J.

Filed Mar. 31, 1982, Ser. No. 363,835
Int. Cl.³ B65D *47/34*
U.S. Cl. 222—309 **15 Claims**



1. A liquid dispensing pump arrangement for dispensing predetermined quantities of a dispensible liquid contained in a vessel, comprising

reciprocating pump means having a dip tube extending into said liquid in said vessel and a depressible pump stem through which the liquid is delivered;

a vessel closure fastenable onto a cooperating port of the vessel and supporting the reciprocating pump means with said dip tube immersed into said liquid and including a pedestal surrounding a portion of said stem and having a generally cylindrical outer surface with a plurality of circumferentially spaced axial cutouts thereon;

a finger-depressible push-button dispensing head disposed atop said stem and including socket means surrounding a top portion of said stem, an outlet nozzle extending from said socket means, and depending skirt means extending over at least a portion of the cylindrical surface of said pedestal;

a helical ramp on said pedestal extending circumferentially at least part way around said stem and having a sloping cam surface engageable with said dispensing head to limit downward stroke distance thereof a plurality of different amounts at a respective plurality of rotational positions of said head relative to said vessel closure;

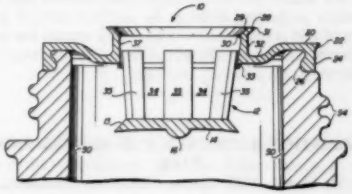
a plurality of circumferentially-spaced fins disposed on said depending skirt means corresponding with at least some of said cutouts and cooperating therewith to define said plurality of rotational positions of said dispensing head relative to said closure and yieldably resisting rotation between such positions.

4,433,800

POURING FITMENT AND CLOSURE ASSEMBLY

Edward W. Owens, Tucson, Ariz., assignor to Top-Seal Corporation, Tempe, Ariz.

Filed Dec. 24, 1981, Ser. No. 334,322
Int. Cl.³ B65D *25/40*
U.S. Cl. 222—547 **17 Claims**



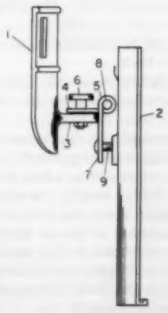
1. A pouring fitment for controlling flow of liquid from an associated container comprising a central tubular body for placement in the opening of the associated container, said tubular body open at the outside end and closed by a disk-like end plate at the interior end, said disk-like end plate having a turbulence introducing beveled peripheral edge forming an acute angle, said acute angle directed interiorly to the associated container in order to introduce turbulence into the liquid and slow the liquid as it flows between the end plate beveled edge and the container side; a plurality of ports through said tubular body proximate said end plate; and means adapted to attach said central tubular body to the associated container opening whereby when the associated container holding liquid is up-ended, the liquid in the container flows into said central tubular body through said ports and out said central tubular body open end.

4,433,801

PAINTER'S CADDY

Glen E. Swinney, Rte. 1, Box 234-A, Axton, Va. 24054

Filed Apr. 2, 1982, Ser. No. 364,877
Int. Cl.³ A46B *17/00*
U.S. Cl. 224—148 **1 Claim**



1. In apparatus for holding and carrying a container with

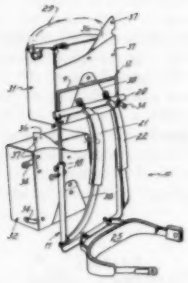
paint therein on the person of a painter wherein a paint holding part is movably linked to a belt carried part by a linking means which provides for damped and restrained movement of said container to enable it to remain generally upright under the influence of its weight and the weight of the carried paint without sloshing or spilling as the painter moves about, the improvements which comprise a horizontally projecting member on said belt carried part having a rounded end, a hinge having a pair of leaf members relatively rotatable about a hinge pin, one leaf of said hinge being pivotally attached to said horizontally projecting member for rotation in a horizontal plane, the second leaf of said hinge being attached to and depending from said first leaf by said hinge pin for rotational movement in a substantially vertical plane, said second leaf being also pivotally connected to said paint holding part for rotation of the latter in a vertical plane perpendicular to the plane of rotation of said second leaf about the hinge pin, said second leaf being impeded from unrestrained movement toward the wearer by contact with said rounded end of said horizontally projecting member on said belt carried part, at least one of said pivotal connections of said second leaf providing frictional resistance sufficient to damp any tendency of said paint carrying part to freely oscillate.

4,433,802

COMBINATION BACK PACK AND BICYCLE SADDLE PACK

Robert M. Woolf, 2722 Queen City Ave., Cincinnati, Ohio 45238

Filed Dec. 9, 1982, Ser. No. 448,388
Int. Cl.³ B62B *1/20*; B62J *9/00*
U.S. Cl. 224—153 **10 Claims**



1. A pack which can be used alternately as a backpack and as a saddle pack for a bicycle, comprising,

a generally rectangular frame,

a pair of pack bags and attachment means for mounting the bags to the frame one above the other thereon for backpack use,

a pair of back straps connectable to the frame for supporting it on a wearer's back,

means for detachably mounting said frame horizontally above the rear wheel of a bicycle, the mounting means comprising,

a bracket mountable to the bicycle adjacent the seat thereon to receive and support one end of the frame and

a support strut mountable at a lower end thereof adjacent the rear axle of the bicycle, the strut when so mounted being swingable about the axle between an out-of-use forward position in which an upper end of the strut is received by said bracket, and an in-use rearward position in which said upper end of the strut is positioned to be connected to the frame to support the frame horizontally over the rear wheel,

means for connecting the strut to the frame, and

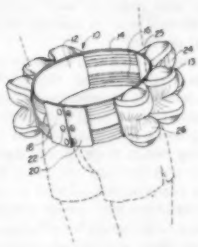
means for attaching each bag to the frame when the latter is mounted to the bicycle, so that the bags hang suspended from the frame on each side of the rear wheel.

4,433,803

TENNIS BALL HOLDER BELT

Gidon Liberboim, 5938 Yarwell, Houston, Tex. 77096

Filed Aug. 7, 1981, Ser. No. 290,869
Int. Cl.³ A45C *11/00*
U.S. Cl. 224—251 **17 Claims**



1. A tennis ball holder belt comprising:

an elongated strip of material suitable for wear by humans, having two connectable ends thereof;

means for connecting said two ends to form a belt;

said belt having at least two panels attached thereto;

each of said panels having a plurality of rows, said rows including a plurality of pocket members, with each pocket member having at least one opening for receiving substantially an entire tennis ball and holding it securely therein;

said panels having an uppermost row of pocket members;

said panels having a lowermost row of pocket members;

at least one of said openings of said pocket members in said uppermost row are oriented 180° to at least one opening on said pocket members in said lowermost row;

whereby when said belt is worn, at least one opening in said pocket member in said uppermost row is upwardly directed and at least one opening in said pocket member in said lowermost row is downwardly directed; and,

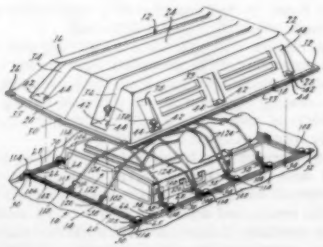
an elastic restraining means associated with each pocket member for receiving and encircling the periphery of the tennis ball thereby retaining said tennis ball substantially in said pocket.

4,433,804

VEHICLE ARTICLE CARRIER

John A. Bott, 931 Lakeshore Dr., Grosse Point, Mich. 48236

Filed Dec. 30, 1981, Ser. No. 335,698
Int. Cl.³ B60R *9/04*
U.S. Cl. 224—321 **9 Claims**



1. An article carrier adapted to be secured to a generally

horizontally extending exterior body surface of a motor vehicle, comprising:

at least two elongated spaced parallel support members fixedly secured directly upon said surface of said vehicle and having a low profile against said surface;

at least two elongated spaced parallel cross members adjustably and removably secured to said support members;

each of said support members and said cross members being of greaer width than height in transverse cross section, with said width extending parallel to said body surface;

said support membrs and cross members having upper article supporting surfaces and longitudinally extending upwardly opening channels, with said supporting surrfaces on the upper sides of said support members and cross members, and clamping surfaces extending longitudinally within the interior of said channels interior to said support members and cross members;

sliding fastener means disposed within said channels clampingly engageable with the clamping surfaces of said channelled support members and cross members, and being slidably adjustably moveable longitudinally in said support members and cross members for repositioning within said respective support member or cross member or on another of said channelled support members or cross members when not clampingly engaged with said clamping surface;

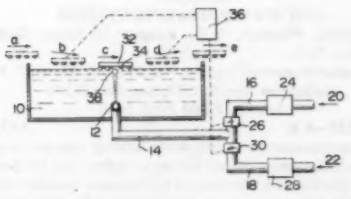
manually engageable means for clampingly engaging said fastener means to said support members or cross members, secured to said sliding fastener means and operably engaging an elongated threaded element projecting into said channel and projecting above said supporting surfaces; article retaining means comprising an enclosure mounted directly upon said article supporting surfaces, said enclosure comprising a front wall, a rear wall, two side walls and a top wall and including exteriorly exposed horizontal portions disposed at least at one of said side, front or back walls of said enclosure and said enclosure including means for disposing said horizontal portions of said enclosure between at least a portion of said manually engageable means and said sliding fastener means, wherein said enclosure is secured to at least one of said support members or cross members by the clamping engagement of said sliding fastener means with at least one of said support members or cross members by said manually engageable means.

4,433,805

SOLDERING METHOD FOR ELECTRIC AND OR ELECTRONIC COMPONENTS

Akira Kanno, Iwate, Japan, assignor to Aiwa Co., Ltd., Tokyo, Japan

Filed Aug. 5, 1981, Ser. No. 290,340
Claims priority, application Japan, Apr. 10, 1981, 56-53040
Int. Cl.³ H05K *3/34*
U.S. Cl. 228—180 R **5 Claims**



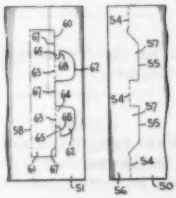
1. A soldering method for soldering components to a printed-circuit board using a bubble type pool of molten solder, comprising introducing compressed air into the molten solder during soldering to form air bubbles which rapidly rise in the molten solder striking against the board and components to achieve soldering of the components to the board, interrupting the supply of compressed air after soldering and, subsequently, introducing inert gas into the molten solder.

4,433,806

CLOSURE INTERLOCK FOR CARTONS OF THE WRAP AROUND TYPE

Robert H. Ganz, Saddle River, N.J., and Guelfo A. Manizza, Blauvelt, N.Y., assignors to Federal Paper Board Co., Inc., Montvale, N.J.

Filed Apr. 21, 1982, Ser. No. 370,387
Int. Cl.³ B65D *5/10*
U.S. Cl. 229—40 **10 Claims**



1. A closure interlock for a closure panel assembly of a carton of the wrap around type, said closure interlock comprising an inner closure panel and an outer closure panel each having a free edge, said inner closure panel having struck therefrom a secondary locking tab carried by a secondary flap with said secondary locking tab being disposed between said free edge of said inner closure panel and said secondary flap, said secondary locking tab facing said free edge of said inner closure panel, the displacement of said secondary locking tab and said secondary flap from said inner closure panel defining an opening in said inner closure panel having as a boundary thereof a primary locking shoulder, and said outer closure panel having a terminal edge flap portion in part defined by a fold line and in part by cut line means, said cut line means defining a primary locking tab carried by said terminal edge flap portion and facing away from said outer closure panel free edge for locking behind said primary locking shoulder, said secondary locking tab being connected to said secondary flap by a narrow neck portion, said narrow neck portion having an outline of which a part defines at least one secondary shoulder on said inner closure panel separate from said secondary locking tab and facing away from said primary locking shoulder, and said secondary locking tab being aligned with said primary locking tab transversely of the length of said closure interlock.

4,433,807

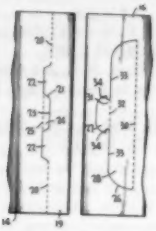
CARTON CLOSURE INTERLOCK

Robert H. Ganz, Saddle River, N.J., assignor to Federal Paper Board Co., Inc., Montvale, N.J.

Filed Apr. 21, 1982, Ser. No. 370,558
Int. Cl.³ B65D *5/10*
U.S. Cl. 229—40 **13 Claims**

1. A closure interlock for a closure panel assembly of a carton of the wrap around type, said closure interlock comprising an inner closure panel and an outer closure panel each having a free edge, said inner closure panel having struck therefrom a secondary locking tab carried by a flap with said secondary locking tab facing said free edge of said inner closure panel, the displacement of said secondary locking tab and said flap from said inner closure panel defining an opening in said inner closure panel having as a boundary thereof a primary locking shoulder, and said outer closure panel having a terminal edge flap portion in part defined by a fold line and in part by cut line means, said cut line means defining a primary locking tab carried by said terminal edge flap portion and facing away from said outer closure panel free edge for locking

behind said primary locking shoulder, said cut line means also defining a secondary locking shoulder facing away from said outer closure panel free edge for having received therebehind said secondary locking tab.

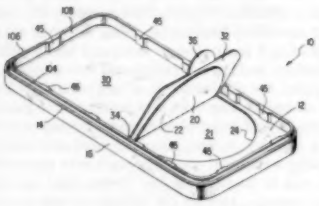


4,433,808

POURABLE, RECLOSEABLE LID

Robert L. Gordon, Monroe, and John G. Smith, Warwick, both of N.Y., assignors to International Paper Company, New York, N.Y.

Filed May 3, 1982, Ser. No. 374,128
Int. Cl.³ B65D *5/64, 5/54, 5/70*
U.S. Cl. 229—43 **11 Claims**



1. A top closure lid construction for a container, the lid being formed of:

(a) a cover member formed of a relatively brittle plastics material, the cover member having means along its periphery for sealing attachment to the upper open end portion of a container, the cover member having a tongue formed integrally therefrom, the tongue partially defined by a weakened hinge-forming line to serve as a hinge for the tongue, the remainder of the tongue defined by a curved cut line extending through the thickness of the cover member, the ends of the cut line terminating, respectively, at the ends of the weakened hinge-forming line, whereby when the tongue is pivoted upwardly about its hinge-forming line, a dispensing opening is defined in the cover member; and

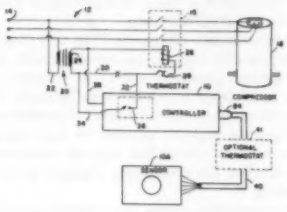
(b) a main paperboard insert superposed on and bonded to the top surface of the cover member and having an end area overlying said tongue, the main paperboard insert having a fold line overlying and substantially aligned with the weakened hinge-forming line of the cover member, the said end area of the main paperboard insert having a pull tab connected thereto, whereby when the pull tab is pulled upwardly, both the cover member tongue and the overlying end area of the main paperboard insert pivot about their respective hinges and fold lines to thereby define an opening in the cover member and the cover member tongue is at least partially broken off from the remainder of the cover member and the tongue is thereafter carried by the end area of the main paperboard insert to thereby preclude blocking of the dispensing opening during dispensing by the inherent resiliency of the plastics cover member material from which the tongue is formed.

4,433,809

CONTROLLER FOR AIR CONDITIONING OR HEATING SYSTEM

Daniel R. Schulz, 1009 Hollywood Ave., Clearwater, Fla. 33519

Continuation-in-part of Ser. No. 129,690, Mar. 12, 1980, Pat. No. 4,288,990, said Ser. No. 129,690, is a continuation of Ser. No. 30,369, Apr. 16, 1979, abandoned. This application Sep. 11, 1981, Ser. No. 301,882
Int. Cl.³ G05D *23/00*
U.S. Cl. 236—47 **20 Claims**



1. A control for heating an air conditioning and/or heating system in a region, comprising in combination:

first means for establishing electrical signals corresponding to an upper and lower temperature of a first temperature range;

second means for establishing electrical signals corresponding to an upper and lower temperature of a second temperature range;

timer means for providing periodic outputs during a given operating cycle;

third means for providing a presence signal upon detecting a person inhabiting the region;

means connecting said timer means to said third means for actuating said third means at a selected one of said periodic outputs of a given operating cycle of said timer means;

said third means providing said presence signal for the remainder of said operating cycle upon detecting a person inhabiting the region; and

fourth means connected to said first, second and third means for controlling the system in accordance with said first temperature range upon a presence signal from said third means and for controlling the system in accordance with said second temperature range upon a lack of a presence signal from said third means.

4,433,810

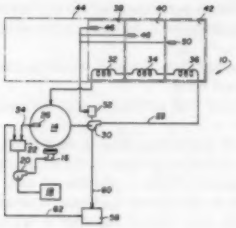
HOT WATER HEATING SYSTEM

Saul Gottlieb, Wantagh, N.Y., assignor to Simon Gottlieb, Brooklyn, N.Y.

Continuation-in-part of Ser. No. 820,296, Jul. 29, 1977. This application Apr. 2, 1979, Ser. No. 25,938
Int. Cl.³ F24D *3/02, 5/10*
U.S. Cl. 237—8 R **3 Claims**

1. An improvement to a hot water heating system for regulating the temperature of said hot water being used for heating purposes therein as a function of the ambient weather conditions, said improvement comprising plural delineated zones to be heated so located as to be affected by changing ambient weather conditions, a hot water circulating system operatively arrange in heating relation to said delineated zones, said hot water circulating system including at least one hot water pumping means for circulating said hot water and temperature-sensitive means in said delineated zones connected in controlling relation to said pumping means for providing operation of

said pumping means for a selected duration of time in accordance with the temperature in said delineated zones as sensed by said temperature-sensitive means, a boiler operatively arranged in heating relation to said circulating hot water to maintain the temperature thereof at a selected temperature level, and control means operatively connected in controlling relation to both said pumping means and said boiler so as to lower the boiler operating temperature when detecting a significantly longer period of non-operation of said pumping means than a period of operation thereof over a given selected period of time, whereby nominal operation of said pumping means indicative of the use of hot water at an excessive temperature for given ambient weather conditions as sensed by said temperature-sensitive means in said delineated zones is modified by corresponding modification of said boiler operating temperature such that there is a reduction in said hot water temperature to that desired extent until there is a correspondingly greater extent of said pumping means duration of operation.



4,433,811

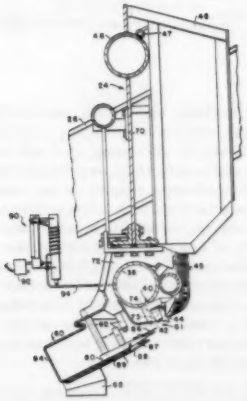
FLOW CONTROLLER

Thomas E. Godfrey, Moore, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Division of Ser. No. 258,410, Apr. 28, 1981, abandoned. This application Oct. 18, 1922, Ser. No. 434,793

Int. Cl.³ B05B *12/10*

U.S. Cl. 239—74 **5 Claims**



1. Apparatus for controlling the flow rate of a non-Newtonian fluid from a fluid jet comprising: a fluid jet, manifold means supplying a non-Newtonian fluid to said jet, means supplying non-Newtonian fluid to said manifold means, control means to control the flow of non-Newtonian fluid from said manifold means and pressure sensitive means operably associated with said manifold means to automatically cause said control means to adjust the flow of fluid from said manifold means upon a change of flow rate from the jet, said control means including an elongated chamber for the non-Newtonian fluid, an inlet tube operably associated with the fluid pressure in said manifold means, a capillary tube connected at one end to said inlet tube and to said chamber at the other end and an outlet tube in communication with said means to supply the non-Newtonian fluid, said outlet tube, said capillary tube and said inlet tube having substantially the same diameter.

4,433,812

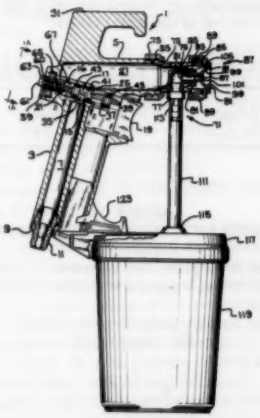
PAINT SPRAY ATTACHMENT

Thomas E. Grime, Temperance, Mich., assignor to Champion Spark Plug Company, Toledo, Ohio

Division of Ser. No. 205,915, Nov. 12, 1980. This application Sep. 30, 1982, Ser. No. 429,153

Int. Cl.³ B05B *7/08, 7/24*

U.S. Cl. 239—290 **12 Claims**



1. A paint spray attachment for a gun for supplying a compressed fluid, the gun having a handle, the handle including a cavity, such paint spray attachment comprising, in combination, a hollow adapter, one end of said adapter positioned on the discharge end of said spray gun, the other end of said adapter defining a discharge opening;

an aperture defined in the wall of said adapter;

a passageway positioned in said adapter, said passageway being in communication with said aperture and terminating in a discharge aperture;

a chamber defined in said adapter around said passageway;

an air cap positioned on such other end of said adapter;

at least one fluid aperture defined in said air cap adjacent said passageway discharge aperture, said fluid aperture being in communication with said chamber;

a cup position in spaced relationship to said adapter;

conduit means between said cup and said adapter aperture;

a bracket for attaching said cup to said gun handle, wherein said bracket is removably positioned in the handle cavity.

4,433,813
METHOD FOR FORMING WOOD FIBRES

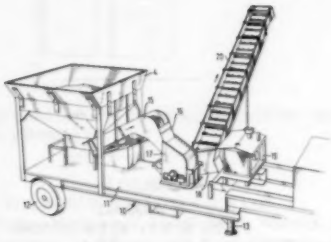
Rodney Whatton, Wych Elm, Ampney Crucis, Cirencester, Gloucestershire, and Timothy W. Gilder, Lypiatt House, Chelworth Rd., Cricklade, Swindon, both of England

Filed Aug. 5, 1980, Ser. No. 175,679

Claims priority, application United Kingdom, Aug. 10, 1979, 7927881

Int. Cl.³ B27I *11/08*

U.S. Cl. 241—21 **9 Claims**



1. A method of forming wood fibres for use in the production of a riding surface comprising feeding wood chips having a length, in the grain direction, of from 18 mm to 35 mm, to a milling machine adjusted to break the wood chips into wood fibres, the lengths of the fibres produced by the milling machine being substantially in accordance with the following percentages by volume, of the total volume:

Wood fibre length	Percentage of Total Fibre
0 mm–5 mm	10%–20%
5 mm–15 mm	40%–55%
15 mm–35 mm	35%–50%

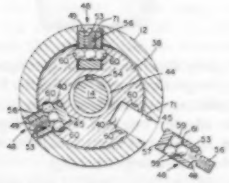
4,433,814
CORE-ENGAGER RETAINER FOR AN EXPANSIBLE SHAFT

Virgil M. Pontes, N. Dighton, and Lawrence C. Young, South Easton, both of Mass., assignors to Double E Company Inc., Brockton, Mass.

Filed Apr. 14, 1983, Ser. No. 485,111

Int. Cl.³ B65H *75/24*

U.S. Cl. 242—72.1 **14 Claims**



1. In an expansible shaft comprising:

an axially-extending housing;

a core engager movable radially relative to said housing between an expanded position in which said core engager extends beyond the outer wall of said housing and a retracted position in which said core engager is positioned radially within said expanded position thereof; and,

an actuator arranged to cause said core engager to move towards and away from said retracted position and said expanded position in response to axial movement of said actuator;

said actuator having a first cam surface inclined with respect to said shaft axis, and a slot at one side of, radially outwardly of, and parallel to said first cam surface; and,

said core engager having a radially inwardly projecting cam follower slidingly engaging said first cam surface, that improvement wherein:

said cam follower includes a cross-bore one end of which overlies and follows said slot as said surface of said cam follower slides along said first cam surface and a second bore which extends generally perpendicular to and intersects said cross-bore;

a first member is positioned within and forms a a slip-fit with said cross-bore so as to be movable axially of said cross-bore;

a second member is positioned within and movable axially of said second bore;

the end of said first member nearer said second bore is convex; and

the length of said first member is such that when said second member is positioned within the intersection of said bores in engagement with a portion of said first member is forced to project from said cam follower into said slot, and when said second member is withdrawn from the intersection of said bores said first member may be positioned wholly within said cross-bore.

4,433,815
TUBE WHICH CAN BE AXIALLY STACKED

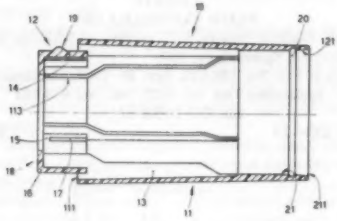
Armando D'Agnolo, Porcia, Italy, assignor to Officine Savio S.p.A., Italy

Filed Oct. 7, 1981, Ser. No. 309,508

Claims priority, application Italy, Oct. 10, 1980, 83447 A/80

Int. Cl.³ B65H *75/18*

U.S. Cl. 242—118 **2 Claims**



1. An axially stackable tube able to sustain bobbins for doubling and twisting operations, comprising a first tubular section defining circumferential alternating rigid and radially elastic segments, each said radially elastic segment defining an arcuate circumferential interference element on the outside thereof, a second tubular section fixed to said first section axially beyond an end face of said second section by axial radial guides positioned interiorly of said first and second sections and fixed to both sections; said second section defining an inner circumferential seat at the other end of said second section for the arcuate interference elements of a second tube whereby the first section acts as a manual grip and the arcuate interference elements of a second tube cooperate with said inner circumferential seat to axially stack two tubes.

4,433,816
WIRE GUIDE AND RETAINER ASSEMBLY

Kenneth E. Rousseau, Wichita, Kans., assignor to Harper Trucks, Inc., Wichita, Kans.

Filed Apr. 12, 1982, Ser. No. 367,170

Int. Cl.³ B65H *49/00, 17/20*

U.S. Cl. 242—129.62 **10 Claims**

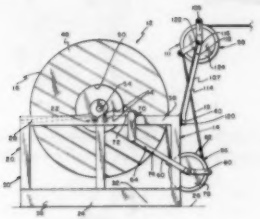
1. A wire guide and retainer assembly adapted to receive and

direct a wire type strand member from a rotatable spool member; comprising:

(a) a support assembly;

(b) a first wire guide assembly having a first frame support assembly with one end connected to said support assembly and a first pulley assembly connected to said first frame support assembly;

(c) said first frame support assembly having support arms with one end pivotally connected to said support assembly and a support shaft connected between outer ends of said support arms;



(d) said first pulley assembly including a first pulley member mounted on said support shaft and a first retainer assembly connected to said first pulley member and pivotally mounted on said support shaft; and

(e) said first pulley member and said first retainer assembly both rotatably mounted on and freely movable axially of said support shaft;

whereby the wire strand member is trained between said first retainer assembly and about said first pulley member and extended in a vertical direction and said first pulley assembly is movable laterally on said support shaft to conform with the position of the wire strand being removed from the spool member.

4,433,817

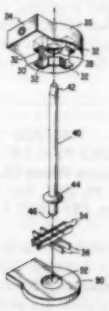
SPOOL PIN HOLDER FOR A SEWING MACHINE

Philip F. Minalga, Piscataway, N.J., assignor to The Singer Company, Stamford, Conn.

Filed Sep. 29, 1982, Ser. No. 426,354

Int. Cl.³ B65H *49/18*

U.S. Cl. 242—134 **4 Claims**



1. A spool pin mounting arrangement for a thread spool comprising a spool pin extending along a first length at least a sufficient distance to accommodate said thread spool, said spool pin including a spherical segment having said first length adjacent one side thereof and a second length to an end thereof adjacent the other side of said segment; a spool pin post having a socket complemental to and accommodating said spherical segment of said spool pin and an aperture extending from the center of said socket to the outside of said spool pin post capable of accommodating said spool pin up to a selected angular orientation therein, means operating on said second length of said spool pin for resiliently allowing said spool pin to displace to said selected angular orientation in said aperture in response to a disturbing force and for applying a restoring force thereto in opposition to said disturbing force for returning said spool pin to a central position upon removal of said disturbing force.

4,433,818

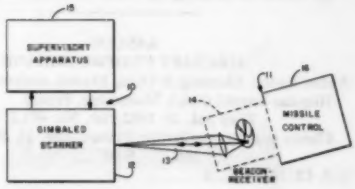
BEACON-RECEIVER FOR COMMAND GUIDED MISSILES

Jerome F. Coffel, New Hope, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jan. 29, 1982, Ser. No. 344,119

Int. Cl.³ F41G *7/26*

U.S. Cl. 244—3.13 **11 Claims**



8. Apparatus for remotely determining the magnitude of the angular disorientation of a body with respect to the axis of a beam of electromagnetic radiation falling thereon, comprising, in combination:

means at a site remote from the body for projecting a beam of electromagnetic radiation along an axis toward the body;

a member carried by the body for receiving and retroreflecting said beam, said member having a patterned surface including a first area which is retroreflective, and a second area which is not retroreflective;

means causing rotation of said member about a spin axis passing through said surface;

focusing means carried by the body at a site spaced from said member and having an optical axis passing through said surface, so that radiation from said beam reaching said focusing means at an oblique angle to said optical axis is focused on said surface as an image which defines on said areas, as said member rotates, a closed curve about said spin axis and is retroreflected through said focusing means in the portion of each rotation of said member during which said image falls on said first area;

and means for receiving the radiation retroreflected through said focusing means and determining the relation of said portion of the total period of rotation of said member, as a measure of said oblique angle.

4,433,819

AERODYNAMIC DEVICE

Alfred C. Carrington, 33811 Morse St., Mt. Clemens, Mich. 48043

Continuation-in-part of Ser. No. 22,068, Mar. 19, 1979, abandoned. This application Feb. 4, 1982, Ser. No. 345,788

Int. Cl.³ B64C *29/00, 39/06*

U.S. Cl. 244—12.2 **7 Claims**

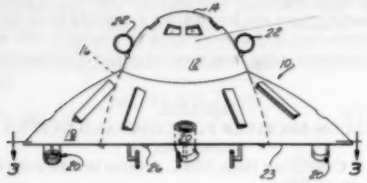
7. An aerodynamic device comprising:

(a) a central body including a vertical axis, an outer wall and a bottom wall;

(b) an outer rotatable disc concentric with the central body axis, including an upper wall and a bottom wall;

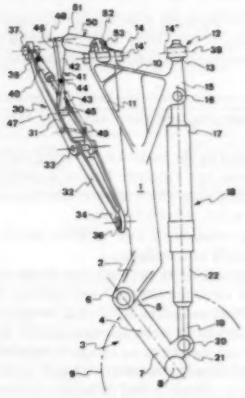
(c) a plurality of jets affixed to the disc bottom wall selectively vectorable between a vertical, tangential or radial direction;

(d) means for counteracting the torque generated by the disc;
(e) means for vectoring the jets in a common direction;



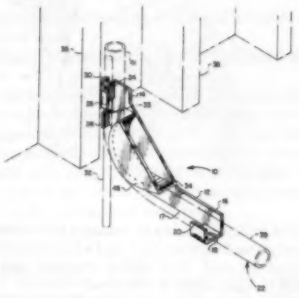
(f) means for rotatably supporting the disc with the central body;
(g) means for rotating the outer rotatable disc.

4,433,820
AIRCRAFT UNDERCARRIAGE
Andre Turiot, Morsang S/Orge, France, assignor to Messier-Hispano-Bugatti (S.A.), Montrouge, France
Filed Jul. 23, 1982, Ser. No. 401,278
Claims priority, application France, Aug. 12, 1981, 81 15586
Int. Cl.³ B64C *25/10*
U.S. Cl. 244—102 R **7 Claims**



1. An undercarriage for an aircraft including a rigid structure, the undercarriage comprising: a leg pivotally mounted about a first pivot axis which is fixed relative to said rigid structure; a main side-brace comprising at least two articulated levers having first ends pivotally connected to each other about a fourth pivot axis, and having respective other ends pivotally mounted about a second pivot axis which is fixed relative to said rigid structure, and about a third pivot axis which is fixed relative to said leg; and drive means for causing said levers to pivot relative to each other; the improvement wherein said first, second, third, and fourth pivot axes are parallel to each other; and wherein said first ends of the levers comprise respective two-tined forks with corresponding pairs of tine ends being pivotally interconnected about said fourth pivot axis, said levers, when in an extended position, having a common center line which intersects said fourth pivot axis at a point S and at an oblique angle α the point S being located between the tines of both forks such that relative to the point S and to the center line of the lever to which it belongs, one tine of each fork constitutes an acute angle side tine and the other tine constitutes an obtuse angle side tine; said forks being so disposed relative to each other that one tine of each fork constitutes an inside tine and the other an outside tine, where the inside tine of each fork is located in between the two tines of the other fork; and wherein said inside tines are said obtuse angle side tines and said outside tines are said actue angle side tines.

4,433,821
CONDUIT BENDING AND SUPPORT DEVICE
Charles N. Bolding, 1504 Roundup Trail, and Paul D. Hastings, 2000 Dixie La., both of Round Rock, Tex. 78664
Filed Aug. 7, 1981, Ser. No. 290,841
Int. Cl.³ F16L *3/08*
U.S. Cl. 248—65 **7 Claims**

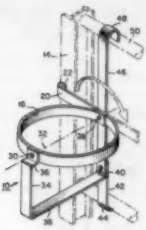


1. A bending and support device for non-rigid tubing such as plastic water distribution conduit and the like for changing the direction of a conduit run and supporting said conduit in the bent condition, said device comprising:
a frame comprising a substantially flat plate including at least two end portions extending at an angle with respect to each other;
a first conduit support bracket fixed to one end portion;
a second conduit support bracket fixed to the other end portion, said support brackets each including respective portions forming channels for receiving and supporting said conduit at opposite ends of a bend in said conduit;
surface means fixed to said frame between said support brackets for supporting said conduit along at least a portion of the inner radius of a bend in said conduit; and
said support brackets are spaced from said surface means sufficiently to permit engaging said conduit by said support brackets and said surface means intermediate the ends of said conduit and without extending an end of said conduit through the channel formed by either of said support brackets.

4,433,822
PAINT CAN RECEPTACLE AND THE LIKE
Nurmi Caggiano, 52 Wagon Wheel Ct., Pulaski, Pa. 16143
Filed Aug. 18, 1981, Ser. No. 293,995
Int. Cl.³ E06C *7/14*
U.S. Cl. 248—210 **6 Claims**

1. A paint can receptacle which comprises, a circular strip horizontally disposed, a J-shaped ladder grip projecting tangentially from said circular strip, for rail engagement by the leg portion thereof, a first pivotal pin positioned in the vicinity of the tangential union of the J-shaped ladder grip and the circular strip, said pivotal pin joining the circular strip with a vertically disposed ladder rung gripping member having an arcuately configurated rung grip terminally disposed thereto and joining a base support member along the opposite end thereof, said pivotal pin being joined intermediately along the vertically disposed ladder rung gripping member, a second pivotal pin positioned diametrically opposite said first pivotal pin, said second pivotal pin joining a downwardly projecting vertical support member said base support member being supported by

said downwardly projecting vertical support member and the vertically disposed ladder rung gripping member, and a downwardly disposed support member having an arcuate ladder



rung brace positioned as a terminal edge thereof and secured to a lower portion of the vertically disposed ladder rung gripping member.

4,433,823

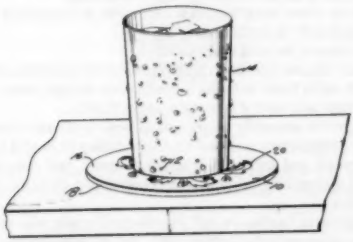
DRINK COASTERS

Mark Pearson, 15 Rae St., East Bentleigh. 3165, Melbourne, Victoria, Australia

Filed Jan. 22, 1981, Ser. No. 227,347

Int. Cl.³ A47G *23/03*

U.S. Cl. 248—346.1 **5 Claims**



1. A drink coaster, comprising:

a disk of microporous metal constituted by a sintered compact of metal powder having a porosity of about 27-30 percent, and having a lower face including at least one portion comprising support surface means by which said coaster may be supported on a table top, said support surface means being constituted by a substantially drink liquid-impervious layer of said metal formed in situ on said sintered compact as an integral feature which is physically at one therewith.

4,433,824

VIDEO PROJECTOR ADJUSTABLE SUPPORT

Mansour Koosha, Endwell, N.Y., assignor to The Singer Company, Binghamton, N.Y.

Filed Dec. 29, 1980, Ser. No. 220,585

Int. Cl.³ F16M *1/00*

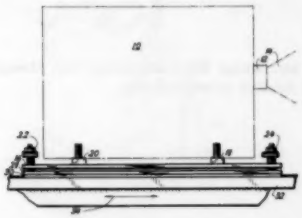
U.S. Cl. 248—662 **6 Claims**

1. Alignment and adjustable support structure for a video projector which permits movement of said video projector out of a precisely aligned position and return without requiring realignment or readjustment, comprising:

a base plate having a first selected shape, a selected thickness, and top and bottom parallel surfaces, said base plate including at least three jack screws having a length greater than said selected thickness for adjusting said base plate relative to a post plate, and each of said jack screws defining an aperture having a first diameter through the longitudinal axis;

means for rigidly securing said video projector to said base plate;

said post plate having a second selected shape, and top and bottom parallel surfaces, said post plate further defining at least three apertures between said top and bottom surfaces of said post plate, said apertures suitable for allowing a fastening means having a diameter smaller than said diameter of said longitudinal aperture of said jack screw to extend therethrough, said longitudinal axis of said apertures through said post plate being perpendicular to said top and bottom parallel surfaces of said post plate, and in register with the longitudinal axis of said apertures through said jack screws;



fastening means extending through said aperture in said post plate and said apertures in said jack screws in register therewith for securing said post plate in a selected position relative to said base plate as determined by said jack screws;

a rolling plate having a selected shape, and top and bottom parallel surfaces, said top surface for supporting said bottom surface of said post plate, said bottom surface of said rolling plate defining a pair of parallel guides such that said rolling plate may be moved along a pair of parallel rails;

means for securing said rolling plate to said post plate; and guide rails for supporting said rolling plate;

so that said video projector is movable out of an aligned and adjusted position and is returnable without requiring a change in alignment or adjustment.

4,433,825

STRESS-RESISTANT MOUNT FOR THE CASING OF A CENTRIFUGAL PUMP

Robert Deraedde, and Jürgen Koch, both of Frankenthal, Fed. Rep. of Germany, assignors to Klein, Schanzlin & Becker Aktiengesellschaft, Frankenthal, Fed. Rep. of Germany

Filed Jan. 27, 1981, Ser. No. 228,965

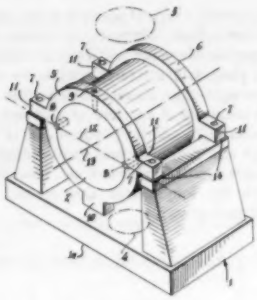
Claims priority, application Fed. Rep. of Germany, Feb. 12, 1980, 3005093

Int. Cl.³ F16M *1/00*

U.S. Cl. 248—672 **18 Claims**

1. The combination of a support; an externally stressed pump casing; and means for securing said casing to said support,

comprising at least one annular member surrounding and carrying said casing to thereby take up stresses acting on said



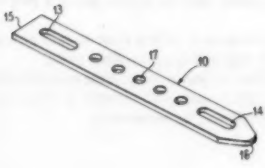
casing, and means for transmitting such stresses from said annular member to said support.

4,433,826

ADJUSTABLE LONG BOLT

Vernon R. Schimmel, Lincolnwood, Ill., assignor to Symons Corporation, Des Plaines, Ill.

Filed Sep. 25, 1981, Ser. No. 305,396
Int. Cl.³ E04G *17/06*
U.S. Cl. 249—38 **18 Claims**



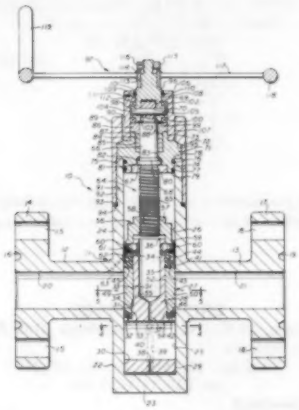
1. In a modular concrete form structure including a concrete form panel and a second panel mounted in angled relation which panels are to be supported together by a prop, the improvement of an adjustable long bolt extendable into slots in the panel and the prop for connecting them together; another of the panels being supported by the prop, the bolt being generally flat along its length, a pair of elongated slots disposed in adjacency to opposite ends of the bolt and at least one circular hole disposed between the slots having its mid-point disposed along a longitudinal line in longitudinal alignment with longitudinal axes of said elongated slots, the longitudinal spacing between said slots with respect to said at least one circular hole being varied to enable the bolt to be installed in a larger number of adjustable positions by turning the bolt on its end through an arc of rotation of 180°, a slotted waler plate carried on the prop with the bolt extended therethrough, a connecting wire tie for insertion into one of said slots adjacent one end of said bolt, and a wedge bolt for insertion through an elongated slot at an opposite end of said bolt thus serving to tie the panels and the waler plate in snug wedged assembly together, the bolt being headless and being hammerable from either end to effect assembly or disassembly from said slotted waler plate.

4,433,827

HIGH PRESSURE SHUT-OFF VALVE

Billy L. Redmon, and Buford G. Forester, both of Pasadena, Tex., assignors to Custom Oilfield Products, Inc., Houston, Tex.

Filed Dec. 4, 1981, Ser. No. 327,331
Int. Cl.³ F16K *25/00*
U.S. Cl. 251—191 **22 Claims**



1. A high pressure shut-off valve comprising

a hollow valve body having an open end, a closed end and a cylindrical cavity therein,

cover means for said open end,

aligned tubular inlet and outlet portions on opposite sides of said valve body defining a continuous straight bore intersecting said cavity at a right angle thereto,

a plug valve assembly positioned in said cavity and comprising a supporting mandrel having a sliding fit in said cavity between and extended position abutting said closed end and a retracted position a predetermined distance therefrom,

said mandrel having an end portion with a laterally extending valve passage therethrough and an intermediate portion closing said valve body bore when in said extended position and said valve passage being aligned with said valve body bore when in said retracted position,

said intermediate portion being of one-piece construction with a fixed radius and providing fixed surfaces of cylindrical configuration having a sliding fit in said cavity,

a sealing sleeve member of elastomeric material surrounding said mandrel intermediate portion and movable relative thereto and engaging the entire circumferential wall of said cavity around said bore to seal the same against leakage when closed, and

operating means for moving said plug valve assembly between said extended and retracted positions and including means engageable with said sleeve member in said extended position to compress the same longitudinally along said mandrel to against leakage of pressure around said intermediate mandrel portion.

4,433,828

REACTOR VESSEL STUD CLOSURE SYSTEM

Stanley R. Spiegelman, Churchill; Robert B. Salton, Plum Borough; Robert W. Beer, Murrysville; Louis J. Malandra, Boston, all of Pa., and Michael L. Cognevich, Houston, Tex., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

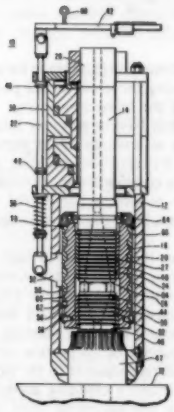
Filed Jan. 29, 1981, Ser. No. 229,362
Int. Cl.³ E21B *19/00*
U.S. Cl. 254—29 A **13 Claims**

1. An apparatus for enabling loosening and tightening of a

stud nut on a reactor vessel stud by forcing compression of a seal between a reactor vessel head and a reactor vessel flange, said apparatus having a certain mass and comprising:

gripper means for grasping the reactor vessel stud comprising a split gripper comprised of a plurality of sections which are movable to a closed position to form a cylinder with an inner surface in gripping contact with an upper end of the vessel stud nut,

said gripper means also including a cylindrical gripper sleeve, having an inner surface surrounding and in sliding contact with said split gripper, disposed for movement up and down, and having wedge means on at least one of said gripper sleeve and said split gripper controlling the opening and closing of said split gripper around the vessel stud to respective disengaged and engaged positions relative to said stud,



actuating means for causing said gripper means to move to said engaged and disengaged positions comprising a plurality of vertically disposed actuator rods affixed by securing means at a lower end to said gripper sleeve and at an upper end to a common plate, said actuator rods being movable longitudinally by movement of said common plate to a first position wherein said gripper sleeve is moved in one longitudinal direction to move said split gripper to said engaged position, said actuator rods being movable longitudinally to a second position wherein said gripper sleeve is moved in the longitudinal direction opposite said one longitudinal direction to said disengaged position, and

means for applying a force of elongation to the vessel stud so that the stud nut may be loosened or tightened.

4,433,829

LOG RAISER

Mark D. Grover, 1700 Spanish Canyon, and Thomas C. Shaffer, 2600 Boonville Rd., both of Ukiah, Calif. 95482

Filed Jul. 26, 1982, Ser. No. 401,941

Int. Cl.³ B65G *7/12*

U.S. Cl. 254—131 **2 Claims**

1. An apparatus for raising a log above ground to facilitate its cutting comprising:

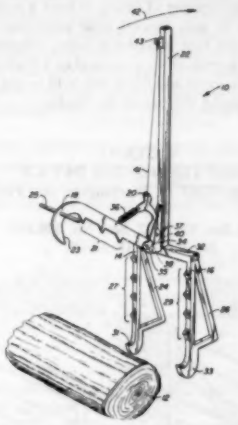
means for contacting the log along a portion of its outer periphery;

a lever arm extending outwardly from said log contacting means;

a hinged claw connected to the lever arm for holding the log against said log contacting means, said claw having means near its hinged connection to the lever arm defining a generally eccentric surface;

means for locking the claw against the log, said claw locking means being rotatably connected to the lever arm and having a generally like eccentric surface for interlocking engagement with the eccentric surface of said claw;

means for connecting said claw to said claw locking means, whereby when said claw is locked against the log the eccentric surface of said claw locking means is moved into



contact with the eccentric surface of said claw and movement of said claw away from the log is substantially prevented; and

means attached to said log contacting means for supporting the log above the ground after the gripped log has been rotated by the lever arm.

4,433,830

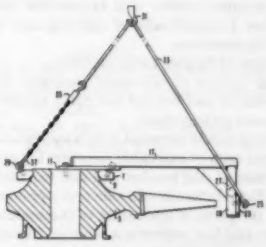
LIFTING SYSTEM FOR A TURBINE DISC

Ira J. Campbell, East Bradford, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 3, 1981, Ser. No. 327,152

Int. Cl.³ B66D *3/00*

U.S. Cl. 254—264 **5 Claims**



1. A lifting system for a turbine disc having a circular array of blades having a generally circular outer periphery and a plurality of holes disposed in said turbine disc, said lifting system comprising a base portion having holes which register with said holes in the turbine disc, said base being disposed on the upper portion of the disc;

an elongated portion which extends from the base portion to beyond the outer periphery of the blades;

a cantilevered portion which extends from the distal end of the elongated portion and over the outer periphery of the blades;

a first means for receiving a hoist disposed on said cantilevered portion and generally aligned with the center of gravity of the disc;

a second means for receiving a hoist disposed on the lower portion of the disc;

a hoist for lifting said disc attached to said first hoist receiving means; and

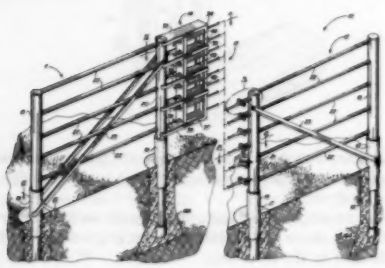
an auxiliary hoist capable of lifting at least a portion of said disc attached to said second hoist receiving means and attached to said first mentioned hoist, whereby the disc can be easily moved from a vertical to a horizontal orientation and vice versa and lifted and held in any orientation without damaging the tips of the blades.

4,433,831

FENCE TENSIONING DEVICE

Richard E. Bunger, 5202 E. Washington St., Phoenix, Ariz. 85034

Filed Jun. 18, 1982, Ser. No. 389,667
Int. Cl.³ B21F *27/00*
U.S. Cl. 256—39 **4 Claims**



1. A fence tensioning and anchoring device for flexible fencing members comprising in combination:

a first upstanding support,

means for anchoring said first support to the ground,

a stress distributing assembly mounted on said first support, said assembly comprising a tension compensating device,

said device comprising a bracket having a top, one side and a bottom,

a bar mounted within said bracket for movement in said bracket longitudinally of said top and bottom and said fencing members,

a plurality of flexible cable members,

one end of each of said cable members extending through said side of said bracket and being anchored to said bar in a spaced arrangement,

coil spring means mounted within said bracket, one mounted around each of said cable members for extending between said side of said bracket and said bar axel applying a tension force between said side and a point on said bar adjacent the point of anchoring of the associated cable member to said bar, whereby a resultant like amount of tension is applied to each of said cable members,

a second upstanding support spaced from said first support,

means for anchoring the other end of each of said cable members to said second support so that said cable members extending between said first and second supports lie under tension in a substantially centerline tensioning arrangement,

a third upstanding support spacedly positioned from said first support,

substantially rigid rail means spacedly mounted in a parallel plane between said first and third supports, and

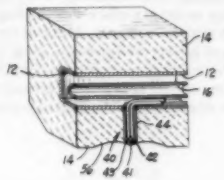
strut means extending between the top of said first support and the anchored end of said third support for anchoring one end of said fence.

4,433,832

METALLURGICAL LANCE

Douglas E. Butts, Brookpark, Ohio, assignor to Inland Enterprises, Inc., Cleveland, Ohio

Filed Dec. 27, 1982, Ser. No. 453,465
Int. Cl.³ C21D *11/00*
U.S. Cl. 266—87 **12 Claims**



1. A refractory clad metallurgical lance for injecting gas into molten metal by emersing the lower nozzle portion of the lance into the molten metal, the lance comprising:

a linear metal conduit having an outer refractory cladding material encasing at least the lower portion of the metal conduit wherein the refractory cladding contains a nozzle discharge opening communicating with said metal conduit to form a nozzle portion, whereby the metal conduit is adapted to transmit inert gas to the nozzle portion of the lance;

thermocouple means disposed within said refractory cladding in the lower portion of the lance, said thermocouple means disposed within a refractory protective tube directed radially outwardly from said metal conduit and within said refractory cladding material, said protective tube having an outermost tip portion within said refractory cladding material adjacent to the exterior peripheral surface of the refractory cladding material, said tip portion containing a thermocouple joint for continuously measuring the temperature of the molten metal while the lance is disposed in the molten metal; and

said metal conduit comprising an interior metal pipe disposed within an exterior tube and secured thereto in a radially spaced relationship to provide an air space between the interior pipe and the outer tube, said outer tube encased within said refractory cladding material, said thermocouple means having lead wires disposed in said air space between the interior pipe and the outer tube and connected to an exterior temperature indicator.

4,433,833

APPARATUS FOR CONTROLLING THE SPRING CONSTANT OF A LAMINATED LEAF SPRING ASSEMBLY

Takayuki Tabe, Tokyo, and Takeyoshi Shinbori, Yokosuka, both of Japan, assignors to NHK Spring Co., Ltd., Yokohama, Japan

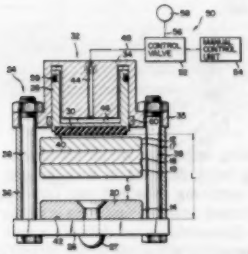
Filed Sep. 13, 1982, Ser. No. 417,383
Claims priority, application Japan, Mar. 23, 1982, 57-46057
Int. Cl.³ B60G *11/36*
U.S. Cl. 267—18 **7 Claims**

1. In an apparatus for controlling the spring constant of a laminated leaf spring assembly used in a vehicle, wherein said leaf spring assembly includes a main spring unit of a first spring constant and a helper spring unit of a second spring constant both extending in the running direction of the vehicle, the spring units being coupled together at their central portions wherein the ends of the main spring unit are attached respectively to the body of the vehicle and the central portion of the main spring unit is attached to a wheel of the vehicle, and wherein a gap is formed between the helper spring unit and the main spring unit when the leaf spring assembly is unloaded, said gap diminishing when a load is applied to the leaf spring

assembly in excess of a predetermined value, the improvement comprising:

clamping means provided at at least two opposite locations on the leaf spring assembly with respect to the central portions of the main spring unit and the helper spring unit for clamping the main spring unit and the helper spring unit to face one another of form a certain gap between the ends of the helper spring unit and the confronting surface of the main spring unit when the leaf spring assembly is unloaded,

said clamping means including a spring supporting member attached to the helper spring unit, hydraulic cylinder means having a hydraulic cylinder and including a press member movable in said cylinder, said cylinder facing said spring supporting member and having an opening at a lower end thereof, said press member being movable in said cylinder between a position wherein said press member is separated from the main spring unit, and a position wherein said press member urges the main spring unit downward to engage with the helper spring unit, and



coupling means for coupling said supporting member and said cylinder means to one another, said coupling means extending from the spring supporting member toward said cylinder means wherein the width of said coupling means is greater than that of the main spring unit; and

hydraulic control means coupled to said cylinder means for driving said clamping means to vary the gap between the spring units,

said hydraulic control means including a fluid source for supplying operating fluid to said cylinder, a control valve for controlling the quantity of the operating fluid supplied to said cylinder, and command means for issuing commands to operate said control valve;

wherein said certain gap between the ends of the helper spring unit and the main spring unit can be reduced by a desired amount by operation of said hydraulic control means to obtain a desired load-deflection characteristic for the leaf spring assembly, said characteristic being functionally related to the first and the second spring constants of the main and the helper spring units.

4,433,834

COMPOSITE CUSHION PAD

Karl J. Jwuc, Tallmadge, Ohio, assignor to Midland-Ross Corporation, Cleveland, Ohio

Continuation of Ser. No. 185,714, Sep. 10, 1980, abandoned, which is a continuation of Ser. No. 121,332, Feb. 13, 1980, abandoned, which is a continuation of Ser. No. 963,381, Nov. 24, 1978, abandoned. This application Dec. 14, 1981, Ser. No. 330,617

Int. Cl.³ F16F *1/40*

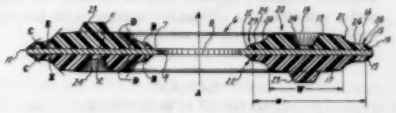
U.S. Cl. 267—141.1 **3 Claims**

1. A composite cushion pad used with like cushion pads in juxtaposed abutting relation to resist a load applied thereagainst, comprising:

(a) a rigid plate having an outer cylindrical periphery in radially spaced relation from a centrally disposed circular opening which extends axially through the plate, at least one annular planar surface being defined between the opening and outer periphery of the plate;

(b) a first resilient solid elastomeric annular cushion secured to, and substantially covering the surface and extending therefrom, the first cushion surrounding the opening and having curved inner and outer marginal sidewalls in radially spaced relation, the inner marginal sidewall being closer the opening and the outer marginal sidewall being closer the outer periphery, the marginal sidewalls of the first cushion generally converging in a direction away from the plate and being disposed at acute angles, relative to the plate, such that under compression the first cushion will not bulge outwardly of the outer periphery of the plate;

(c) a second resilient solid elastomeric annular cushion superimposed on the first cushion and integrally formed therewith and extending therefrom in a direction away from the plate, the second cushion having a curved inner



marginal sidewall which is laterally offset inwardly from the inner marginal sidewall of the first cushion in a direction away from the opening, and a second outer marginal sidewall which is laterally offset inwardly from the outer marginal sidewall of the first cushion in a direction toward the opening, the marginal sidewalls of the second cushion generally converging towards each other in a direction away from the plate and being disposed at acute angles, relative to the plate, that are greater than correspondingly measured angles of the closest marginal sidewalls of the first cushion to provide a sharp difference between the initial soft cushioning and subsequent stiff cushioning of the pad, the top second cushion having an annular outer surface which is substantially flat and in a plane which is parallel to the planar surface of the plate, and the bottom first cushion having a pair of outer annular surfaces which connect the laterally offset marginal sidewalls of the first and second cushions and which are substantially in the same plane and generally parallel to the plane of the planar surface of the plate.

4,433,835

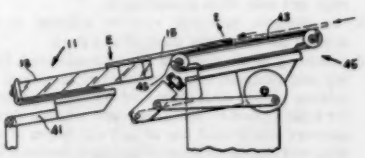
WAFER CHUCK WITH WAFER CLEANING FEATURE

William R. Wheeler, Saratoga, Calif., assignor to Tencor Instruments, Mountain View, Calif.

Filed Nov. 30, 1981, Ser. No. 325,688

Int. Cl.³ B25B *11/00*

U.S. Cl. 269—14 **3 Claims**



1. A wafer chuck and wafer pusher comprising,

a rigid, wafer support surface, having a gross area at least as great as the area of a wafer to be supported, said surface having a plurality of peaks and valleys, said peaks being truncated members having equal elevation, said peaks

forming mesas having polygonal edges thereby defining a support plane for the wafer, the ratio of the aggregate area of said peaks contacting the wafer compared to the valleys between said peaks being less then ten to one, said support surface having an area generally congruent with the area of a wafer to be supported, said congruent area of the support surface including a chordal edge region having an upright rigid wafer stopping member extending in elevation above the wafer support plane, the peaks of the support plane forming mesas with polygonal edges in said support plan parallel to said chordal edge,

means for communicating vacuum pressure to said valleys, said means of communicating vacuum pressure being variable to release said wafer for travel across the mesas, and

wafer pushing means comprising a pair of resilient rollers mounted on top of upright arms, the bottoms of said arms hinged for bringing said rollers below said support plane in a first position and placing said rollers in the support plane in a second position, said wafer pushing means being disposed adjacent to said support surface for urging a wafer oriented in a congruent manner with the support surface into an overlying relation therewith.

4,433,836

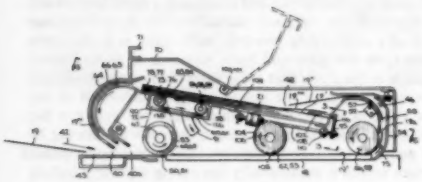
END OF STACK SENSOR

Walter J. Kulpa, Norwalk, and John R. Paulik, Newtown, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Oct. 9, 1981, Ser. No. 309,868

Int. Cl.³ B65H *3/04*

U.S. Cl. 271—3.1 **4 Claims**



1. In a recirculating sheet feeding apparatus in which a plurality of sheets are fed successively from one surface of a stack thereof to a processing station and then returned to the opposite surface of the stack, a device for determining when all of the sheets in the stack have been fed to the processing station and returned to the stack, said device comprising:

a. support means for supporting a stack of sheets to be fed successively to the processing station, said support means including an aperture therein located so as to normally be obstructed by said stack,

b. feeding means for feeding sheets successively from one surface of said stack to the processing station and for returning the sheets to the opposite surface of said stack, the returning of said sheets to said stack defining a trailing edge and side edges of said stack,

c. an elongate separator member adapted to normally contact the outermost sheet of said stack,

d. mounting means disposed adjacent said stack for mounting said elongate separator member to extend inwardly relative to said stack from said trailing edge thereof and for rotating said elongate separator member through said aperture and around one of said side edges of said stack after said outermost sheet of said stack has been fed to said processing station and returned to said stack so that said elongate separator member again contacts said outermost sheet, said mounting means comprising a rotatable shaft mounted on said support means and an arm mounted on said shaft for rotation therewith in a plane adjacent and parallel to said trailing edge of said stack, said elongate separator member being mounted on said arm such that said elongate separator member moves in an orbital path around said shaft, and

e. drive means operable to move said mounting means to cause said rotation of said elongate separator member whereby each rotation of said elongate separator member provides an indication that all of the sheets in said stack have been fed to said processing station and returned to said stack.

4,433,837

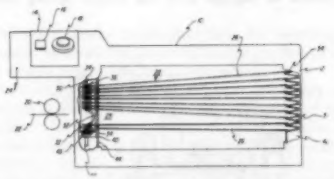
SHEET SORTER APPARATUS

Robert F. Romanowski, Rochester, N.Y., assignor to Salvatore Latone, Rochester, N.Y.

Filed Jan. 21, 1981, Ser. No. 226,997

Int. Cl.³ B65H *39/11*

U.S. Cl. 271—293 **20 Claims**



1. Sheet sorting apparatus which comprises a plurality of sheet receiving trays disposed in a stack, said trays having forward sheet receiving ends and rear ends opposite to said forward ends, means retaining said trays in stacked relationship and moveable therewith, means defining a path along which said trays and retaining means are movable, said path including first, second and third regions, said third region defining steps with said first and second regions at the opposite ends of said third region where adjacent ones of said trays are spaced apart to receive said sheets, said retaining means being a carriage having an opening equal in length to the height of said stack at the forward ends of said trays, said trays being disposed in said opening, and means engageable with the tray at the step at one end of said third region or with the tray at the step at the opposite end of said third region to carry the engaged tray between the ends of said third region to move said stack with said retaining means carriage along said path.

4,433,838

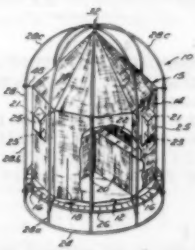
EXERCISE STRUCTURE AND BALL GAME

Donald W. Gordon, Yorba Linda, Calif.

Filed May 16, 1979, Ser. No. 39,347

Int. Cl.³ A63B *5/00*

U.S. Cl. 272—65 **11 Claims**



1. A structure for use as an exercise compartment comprising:

means for forming a rebound surface, said surface acting as

a horizontal springboard which allows a user to exercise by jumping on said surface;

rigid support means for supporting said rebound surface; and

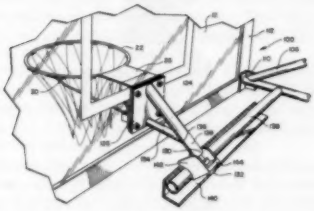
means for enclosing the air space above said rebound surface to form a cell above said rebound surface, said cell of a sufficient size to permit one or more humans to use said rebound surface as an exercise springboard, said enclosing means positioned at or within the outer perimeter of said surface to protect the user from being injured by falling from said surface or by encountering said rigid support means while exercising.

4,433,839

BASKETBALL RIM ASSEMBLY

John Simonseth, 18936 11th Ave. NE., Seattle, Wash. 98155

Filed Mar. 25, 1982, Ser. No. 361,795
Int. Cl.³ A63B *63/08*
U.S. Cl. 273—1.5 R **5 Claims**



5. A basketball rim assembly comprising:

(a) a backboard of generally conventional planar configuration with a front surface, a rear surface, and a perimeter portion, said backboard having a set of circular through mounting holes at a rim mounting location, said through mounting holes being spaced from one another and each having a first diameter;

(b) a basketball rim having a generally conventional configuration and comprising a circular rim member with a front portion and a rear portion, and a mounting portion comprising a vertical front mounting plate positioned generally coplanar with and proximate to the front surface of the backboard at the mounting location;

(c) a unitary rigid force transfer means for absorbing and distributing forces exerted on said basketball rim, said force transfer means including backboard support members supporting said backboard, a frame on said backboard, a torsion bar affixed to said frame and positioned immediately adjacent to and spaced from said backboard, a vertically oriented rear mounting plate positioned at said mounting location, said rear mounting plate having a planar surface located adjacent to and spaced from said backboard, said rear mounting plate being rigidly affixed to said torsion bar, a plurality of connecting members rigidly connected between said vertical front mounting plate and said rear mounting plate, said connecting members each having a maximum dimension less than said first diameter to define a clearance between the surfaces of said connecting members and said backboard, each connecting member being positioned to extend through a respective one of the through holes in the backboard and securing said front mounting plate to said rear mounting plate with said backboard being located therebetween, said force transfer means absorbing forces exerted on said basketball rim by transferring said forces to said torsion bar via said connecting members and said front and rear plates, and to said frame via said torsion bar and from said frame to said backboard support members thus preventing those forces from being applied to said backboard.

4,433,840

ELECTRICALLY CONDUCTIVE GAME BALL

John A. Van Auken, 16 La Gorce Cir., Miami Beach, Fla. 33141

Continuation of Ser. No. 77,729, Sep. 21, 1979, Pat. No. 4,299,384, which is a continuation-in-part of Ser. No. 683,283, May 5, 1976, abandoned, which is a continuation-in-part of Ser. No. 570,766, Apr. 23, 1975, abandoned. This application Nov. 10, 1981, Ser. No. 320,066
The portion of the term of this patent subsequent to Nov. 10, 1998, has been disclaimed.
Int. Cl.³ A63B *61/00*
U.S. Cl. 273—61 R **1 Claim**

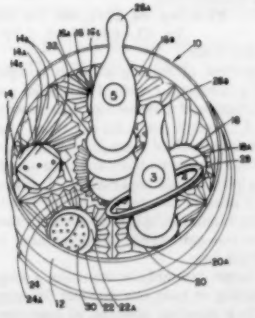
1. A tennis ball for use with an electrical detection circuit in which touchdown of the ball in a selected area is detected by completion of a circuit between spaced apart electrical conductors lying in said area, said tennis ball comprising an elastically deformable sphere, a cover covering said sphere, a multiplicity of electrically conductive fibers incorporated into said cover and having portions on the inner and outer sides of said cover, and electrically conductive means formed separately of said fibers and said cover and lying entirely and solely between said cover and said sphere without passing through said cover and without being incorporated into said cover, said electrically conductive means being in contact with and electrically interconnecting the portions of said fibers on the inner side of said cover, said electrically conductive means cooperating with said fibers to provide an electrically conductive network extending along the inner side of said cover and passing through said cover to extend along the outer side of said cover for completing a circuit across a pair of said conductors upon touchdown of the tennis ball on said conductors.

4,433,841

MULTIPLE CHOICE TOSSING GAME

Bill S. Kim, 1238 S. Orange Dr., Los Angeles, Calif. 90019, and Jung J. Ban, 161 S. Occidental Blvd., #1, Los Angeles, Calif. 90057

Filed May 11, 1982, Ser. No. 377,004
Int. Cl.³ A63B *67/06*
U.S. Cl. 273—338 **1 Claim**



1. In a multiple choice tossing game, playable with tossing

rings and other tossing means by one as well as several participants, comprising:

(a) a bowl shaped base, having an upper circular edge and therewithin a plurality of numbered pits including a center pit around which the other pits are circularly disposed, said pits, respectively are flat bottomed and terminate in an upper circular edge, from which a plurality of narrow mutually offset sections radiate slanting upwardly towards the said upper edge of the bowl, so as to terminate in and form ridges with slanting sections from adjacent pits,

(b) A plurality of numbered bowling pins, for receiving the tossing rings, capable of being pressure fitted, respectively within the pits, said pins are removable, so that the pits of the base may be utilized for receiving other tossing means.

4,433,842

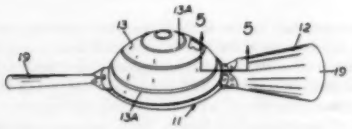
TARGET PIGEON

Millo Bertini, 679 Garden St., Trumbull, Conn. 06611

Filed Jan. 26, 1981, Ser. No. 228,088

Int. Cl.³ F41J 9/16

U.S. Cl. 273—363 **12 Claims**



4. A target pigeon comprising

a generally flat web formed at a web axis with a central throughgoing hole and having a pair of diametrically opposite ends;

a pair of vanes on said web extending diametrically oppositely from said ends thereof and tipped propeller-fashion to each other;

a pair of diametrically opposite holding tabs on said ends of said webs directed generally axially and tipped inwardly toward each other, said vanes, web, and tabs being integrally formed and together having a predetermined relatively great mass; and

a cup-shaped witness cap having an axially directed and substantially circular annular rim centered on a cap axis and formed with a pair of diametrically opposite outwardly open notches, said rim being axially engageable with said ends of said web inwardly of said tabs with said tabs fitting in said notches, said cap having a predetermined relatively small mass relative to said great mass.

4,433,843

MULTI-PLY PAPER TARGET

Larry J. Bricco, Neenah, Wis., assignor to Laminations Corporation, Neenah, Wis.

Filed Sep. 24, 1981, Ser. No. 305,191

Int. Cl.³ F41J 1/08, 1/10

U.S. Cl. 273—407 **31 Claims**

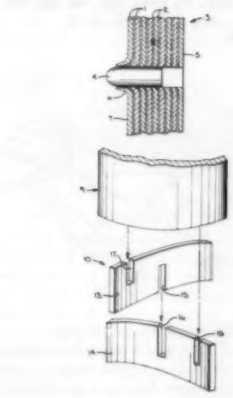
8. A method of making a target comprising the steps of selecting a continuous web of sheet-like paper material from recycled chipboard material having a density of from about 3.0 to about 3.5 pounds per point of caliper, convolutely winding said continuous web of sheet-like paper material into a tubular structure having substantially coplanar successively outwardly extending plies of said paper material, adhesively bonding the respective plies to one another as the winding proceeds, and cutting the tubular structure to form a substantially non-shattering and non-splintering target member having a predetermined target face.

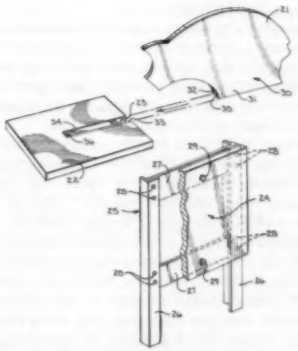
13. A target assembly, comprising a target member and a base including at least one member for supporting the target member in a shooting position, at least one of said base and target members comprising a multiplicity of substantially coplanar plies of paper sheets adhesively bonded together into a rigid laminate wherein each of said plies is composed of recycled chipboard having a thickness ranging from about 0.025 inches to about 0.035 inches and said recycled chipboard has a density of from about 3.0 to about 3.5 pounds per point of caliper.

20. A substantially non-shattering, non-splintering and non-ricocheting target assembly, comprising

a substantially flat base of convolutely wound, substantially coplanar paper plies adhesively bonded into a substantially rigid laminate having an upwardly directed face including a slot separating a pair of spaced side edges, and

a silhouette of convolutely wound, substantially coplanar paper plies adhesively bonded into a substantially rigid laminate having a top portion forming a predetermined





target shape and a bottom portion including a supporting projection to be removably retained within said base slot and having first and second oppositely spaced side edges to be removably engaged by said first and second base side edges, respectively, to provide upstanding support of said silhouette by said base.

22. A substantially non-shattering, non-splintering and non-richocheting target assembly, comprising

a first base member of convolutely wound, substantially coplanar paper plies adhesively bonded into a substantially rigid laminate having a first supporting side edge and an oppositely disposed second side edge including first and second upwardly directed notches,

a second base member of convolutely wound, substantially

coplanar paper plies adhesively bonded into a substantially rigid laminate having a first supporting side edge including a downwardly directed notch removably retained within said first upwardly directed notch and a second oppositely spaced side edge providing a third upwardly directed notch,

said first and second base members removably joined by said first upwardly directed notch and said downwardly directed notch to form an X-shaped base sub-assembly supported by said first supporting side edges, and

a target of convolutely wound, substantially coplanar paper plies adhesively bonded into a substantially rigid laminate forming a predetermined target shape and having a supporting side edge removably engaged within said second and third upwardly directed notches to provide upstanding support for said target while permitting ready disassembly and re-assembly for replacing a worn-out target and transporting said target assembly.

25. A substantially non-shattering, non-splintering and non-richocheting target assembly, comprising

a first U-shaped base member of convolutely wound, substantially co-planar paper plies adhesively bonded into a substantially rigid laminate having a first supporting side edge and a second oppositely spaced side edge providing a first upwardly directed notch,

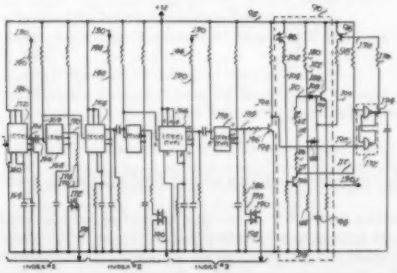
a second U-shaped base member of convolutely wound, substantially co-planar paper plies adhesively bonded into a substantially rigid laminate having a first supporting side edge and a second oppositely spaced side edge providing a second upwardly directed notch, and

a U-shaped target of convolutely wound, substantially co-planar paper plies adhesively bonded into a substantially rigid laminate including a base portion providing a target face and first and second spaced leg portions vertically extending along said target face, a side edge of said U-shaped target removably retained within said first and second upwardly directed notches to provide upstanding support for said target while permitting ready disassembly and re-assembly for replacing a worn-out target and transporting said target assembly.

4,433,844
DRIVE MECHANISM FOR A VARIABLE SPEED GAMING DEVICE

Donald E. Hooker, Wilmette, and Roman A. Tojza, Chicago, both of Ill., assignors to Bally Manufacturing Corporation, Chicago, Ill.

Division of Ser. No. 136,818, Apr. 3, 1980, Pat. No. 4,373,727. This application Jun. 4, 1982, Ser. No. 385,009
The portion of the term of this patent subsequent to Feb. 15, 2000, has been disclaimed.
Int. Cl.³ A63F *5/04*
U.S. Cl. 273—143 R **8 Claims**



1. A drive mechanism for actuating and rotating a rotatable shaft to which a toothed ratchet means is attached in response to movement of an operating handle through an operating stroke, comprising:

plate means that is movable from a rest position to an extended position;

pawl means pivotably carried by said plate means and being adapted to move from a rest position to engage the ratchet means for rotating the same during operation;

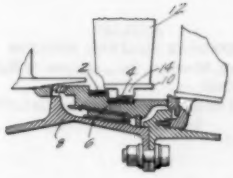
drive means operably connected to said pawl means and plate means and adapted to move said pawl means from a rest position and cause said pawl means to engage said ratchet means during a first interval of movement and to drivingly rotate said ratchet means and shaft during a further interval of movement, said drive means operating at a speed that is proportional to the strength of the electrical signal applied thereto;

circuit means for generating the electrical signals and applying the same to said drive means, the strength of the signals being proportional to the speed with which said operating handle is moved through its operating stroke.

4,433,845
INSULATED HONEYCOMB SEAL

Lawrence T. Shiembob, Rocky Hill, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Sep. 29, 1981, Ser. No. 306,838
Int. Cl.³ F16J *15/40*
U.S. Cl. 277—1 **6 Claims**



1. In the manufacture of a seal for a row of turbine blades the steps of:

providing a honeycomb seal with the cells therein substantially radial;

closing the outer ends of the cells by a surrounding ring; and

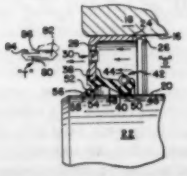
flame spraying an insulating material into the cells to fill at least partially the cells radially inward from the outer ends, the insulating material being clay particles with an alloy coating and

curing this material to the desired hardness by the heat of the flame spraying.

4,433,846
READILY REMOVABLE SHAFT SEAL INCLUDING VENTING TAB

Richard A. Romero, and Michael J. Schmidt, both of Schaumburg, Ill., assignors to Chicago Rawhide Manufacturing Company, Elgin, Ill.

Filed Apr. 20, 1983, Ser. No. 486,983
Int. Cl.³ F16J *15/16, 15/32*
U.S. Cl. 277—9 **12 Claims**



1. A fluid seal for retaining lubricant within a sealed region

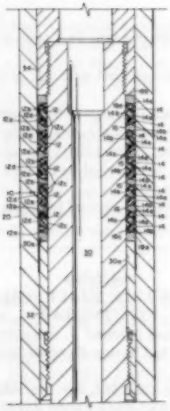
during relative movement of two machine members, said seal comprising, in combination, a relatively rigid casing portion adapted to be received in fluid tight relation with respect to the first of said two machine members, said casing including a mounting surface portion adapted for snug reception with respect to said first member, another, spaced apart bonding portion adapted to have a portion of an associated sealing lip body bonded thereto, and an intermediate casing portion extending between said mounting portion and said bonding portion, and an elastomeric primary sealing lip body having a frusto-conical surface generally directed towards said sealed region and a frusto-conical surface directed generally away from said sealed region, with said frusto-conical surfaces meeting along a generally circular or sinuous locus defining a seal band for intended engagement with part of the second of said machine members, said sealing lip body also having a bonding portion bonded to said bonding portion of said casing, with at least said intermediate portion of said casing having a cut through portion and at least part of a hinge portion combining to define at least a portion of the periphery of a predetermined tab area to provide a vent permitting passage of gas and vapor into and out of said sealed region, said tab area also being an area capable of removal or bending when engaged with a tool adapted to be used in removing said seal from said first machine member.

4,433,847

CONDUIT SEALING SYSTEM

Roger A. Weinberg, Houston, Tex., assignor to Baker Oil Tools, Inc., Orange, Calif.

Filed Mar. 25, 1982, Ser. No. 361,678
Int. Cl.³ F16J *15/12*
U.S. Cl. 277—125 **12 Claims**



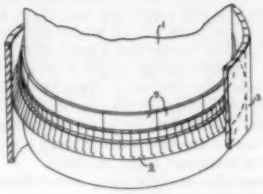
1. In a seal system mountable on a first conduit and sealingly engagable with a second conduit within a well bore for isolating an annular section between said conduits, the improvement comprising a plurality of axially spaced, annular, elastomeric sealing elements having a truncated pear-shaped cross-section with an inner peripheral surface of greater axial length than the outer peripheral surface and reversely curved side wall surfaces connecting said inner and outer peripheral surfaces, an annular bearing element formed of a relatively nonextrudable bearing material abutting each axial side of each said elastomeric sealing element with a correspondingly shaped reversely curved surface, and means for axially clamping all said sealing elements and retaining elements in assembly.

4,433,848

LARGE ANNULAR SEGMENTED SEAL WITH LOCK PORTIONS FOR MISSILE LAUNCH TUBE

W. Wayne Williams, Westwood, Calif., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 20, 1982, Ser. No. 451,585
Int. Cl.³ F16J *15/10, 15/32;* F41F *3/04*
U.S. Cl. 277—199 **5 Claims**



1. A seal for a large annular opening, said seal comprising:

a plurality of overlapping seal segments disposed in an annular array;

each seal segment having a base portion, which fits a cylindrical surface, and a seal portion extending at such an angle to the base portion to form an acute angle with said base portion on a high pressure side of said seal segment;

each seal portion having side margins with diagonally opposing steps, which overlap steps on adjacent seal portions;

a plurality of seal portions disposed adjacent each other and having a bulbous distal end with an opening in the bulbous end which registers with adjacent openings; and

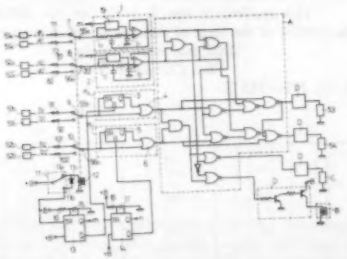
an elongated member, which fits into said opening, to positively lock said bulbous ends together.

4,433,849

CONTROL CIRCUIT FOR A VEHICLE LEVELING SYSTEM

Taiji Ohmori, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 9, 1981, Ser. No. 319,471
Claims priority, application Japan, Nov. 13, 1980, 55-159864; Nov. 14, 1980, 55-160609
Int. Cl.³ B60G *17/00*
U.S. Cl. 280—6 R **8 Claims**



1. In a control circuit for a vehicle levelling system, including:

detecting means for detecting a change in vehicle height with respect to a predetermined reference vehicle-height position and generating a pair of control signals consisting of a directional signal and a command signal, said directional signal indicating whether the direction of displacement is upward or downward and said command signal indicating whether the vehicle height adjustment is to be made or stopped;

control circuit means for controlling the operation of a mechanical system to adjust the vehicle height to said reference position according to said control signals; and

a holding circuit which, when said command signal has changed from an adjustment-off signal to an adjustment-on signal, holds said adjustment-off signal for a certain period of time and then allows said adjustment-on signal to be transmitted to said control circuit, the improvement comprising:

said detecting means being constructed so as to detect change in vehicle height with respect to a plurality of different reference vehicle-height positions, each of said reference vehicle-height positions having a predetermined proper vehicle height range;

switching means for selecting any of said plurality of reference vehicle-height positions, said switching means being mounted at the input section of said control circuit means for controlling the operation of said mechanical system; and

a circuit for temporarily interrupting the function of said holding circuit at the time of operation of said switching means.

4,433,850

FRONT WHEEL SUSPENSION SYSTEM FOR MOTORCYCLES

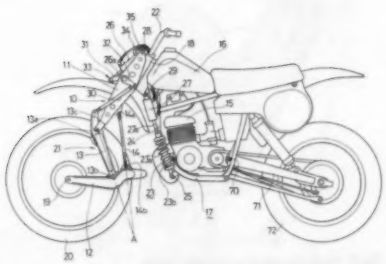
Shinichi Miyakoshi, Saitama, and Tokio Isono, Tokyo, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 9, 1982, Ser. No. 356,362

Claims priority, application Japan, Mar. 10, 1981, 56-34421; Mar. 20, 1981, 56-40753

Int. Cl.³ B62K *25/12*

U.S. Cl. 280—277 **18 Claims**



1. A front wheel suspension system for motorcycles, comprising:

a vehicle body frame;

an upper fork supported by said vehicle body frame;

a lower fork which supports a front wheel;

links connecting between said upper fork and said lower fork;

a shock absorber including at least a damper;

transmission system means for transmitting to said shock absorber a load applied from said front wheel to said lower fork and said links;

said shock absorber being fixed to said vehicle frame;

said load transmission system means for said shock absorber including a pressure fluid circuit, and said shock absorber being operated through a fluid pressure;

said fluid circuit comprising:

a first fluid pressure cylinder, said first cylinder having a first piston slidably disposed therein and being supported by said upper fork;

a second fluid pressure cylinder, said second cylinder having a second piston slidably disposed therein and being supported by said vehicle body frame;

pipe-line means connected between said first cylinder and said second cylinder, the outside end of a piston rod of said first piston being connected at least operatively to said connecting links and the outside end of a piston rod of said second piston being connected to one end of said shock absorber;

said pipe-line means being disposed between said first cylinder and said second cylinder so that the movement of said first piston upon upward movement of said front wheel causes a compressing action in said shock absorber through an extruding action of said second piston of said second cylinder;

said first cylinder being pivotably connected at the upper end thereof to an upper portion of said upper fork; and

the outer end of the piston rod of said first piston is connected to said connecting links through a linkage.

4,433,851

FRONT SUSPENSION SYSTEM FOR MOTORCYCLES

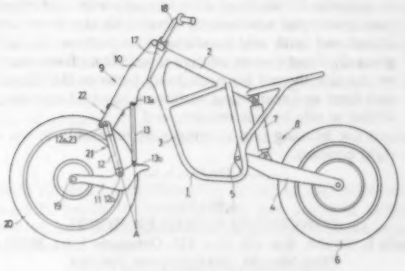
Shinichi Miyakoshi, Saitama, and Tokio Isono, Tokyo, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 16, 1982, Ser. No. 408,286

Claims priority, application Japan, Aug. 17, 1981, 56-122104[U]

Int. Cl.³ B62K *25/12*

U.S. Cl. 280—277 **6 Claims**



1. A front suspension system for a motorcycle, comprising:

an upper fork member supported for pivotal steering motion by a vehicle body frame;

a lower fork member which supports a front wheel at one end thereof;

a link mechanism which pivotably suspends said lower fork member from said upper fork member; and

at least one pivotable-shaft actuated damper having a pivot shaft adapted to provide a pivotal reaction force proportional to a pivoted amount thereof in operative cooperation with said link mechanism, said pivotable-shaft actuated damper being disposed substantially entirely in the interior of said upper fork member.

4,433,852

FOLDABLE AND PORTABLE VEHICLE

David T. Hon, Los Angeles, Calif., assignor to Hon Corporation, Los Angeles, Calif.

Filed Feb. 12, 1981, Ser. No. 233,624

Int. Cl.³ B62K *15/00*

U.S. Cl. 280—278 **48 Claims**

19. A foldable and portable vehicle having a folding frame comprising:

front and rear generally triangular frame sections disposed normally in end to end relation and joined together by a generally upright hinge for folding of said sections about an upright axis into side-by-side relation;

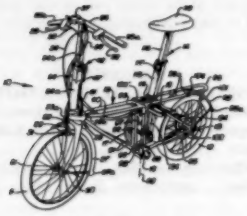
said front frame section having a generally flat and generally horizontal upper side, and a vertically compact front

wheel mount at the front end of said upper side substantially level with said upper side;

said rear frame section having an upright front side and a downwardly and rearwardly inclined rear upper side and a rear wheel mount at the rear end of said rear upper side,

an elongated steering post normally disposed in an upright position above said front wheel mount, and having a lower end immediately above the front wheel mount, said steering post being joined at its upper end to a handlebar having laterally projecting opposite end portions;

hinge means pivotally supporting said steering post for downward swinging of said steering post and handlebar



about an axis extending along one side of said lower end of said steering post into a depending folded position in which the steering post and handlebar are offset laterally to one side of the front wheel mount with said steering post lower end substantially level with the front wheel mount and with said handlebar end portions extending generally front-to-rear relative to said front frame section on the side thereof for positioning between the planes of said front and rear frame sections when said sections are folded to side-by-side relation; and

means for latching said steering post releasably in the upright position.

4,433,853

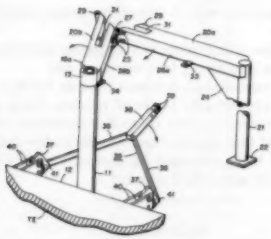
CONVERTIBLE TRAILER HITCH

Dennis L. Swaim, Rte. #4, Box 323, Ottumwa, Iowa 25501

Filed May 21, 1982, Ser. No. 380,516

Int. Cl.³ B60D *1/00*

U.S. Cl. 280—415 R **5 Claims**



1. In a convertible trailer hitch including a gooseneck arm having first and second arm members, the second arm member extending transversely from adjacent one end of the first arm member, the two arm members lying in and partially bounding a first plane, the second arm member including means for pivotally attaching its end remote from the first arm member to a towing vehicle, the improvement comprising: first pivot means for pivoting the other end of the first arm member to a towed vehicle for swinging movement of the first arm member in a second plane transversely of the first plane; and a brace member having one end removably attached to the first arm member intermediate said ends thereof, the other end of the brace member including second pivot means for pivoting the brace member to a trailer for swinging movement of at least a portion of the brace member in said first plane away from the first arm member when detached therefrom, said one end of the brace member including means for attaching the same to a towing vehicle in the vicinity of its rear bumper when the brace member is detached from the first arm member and swung as aforesaid, said other end of the brace member also including said means in conjunction with said second pivot means for rigidly attaching said other end of the brace member to a trailer when said one end of the brace member is attached to a towing vehicle as aforesaid.

4,433,854

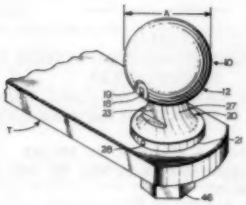
INTERCHANGEABLE BALL HITCH

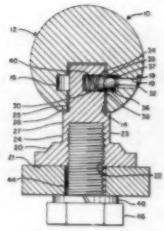
Jerry R. Smith, Littleton, Colo., assignor to Innovative Research, Littleton, Colo.

Filed Oct. 19, 1981, Ser. No. 312,247

Int. Cl.³ B60D *1/06*

U.S. Cl. 280—511 **12 Claims**





1. Ball hitch apparatus, comprising:

a support base having a stub shaft extending upwardly therefrom;

a latch pin in said stub shaft adapted to protrude radially outwardly therefrom; and

a generally spherical body with a bore extending radially inward from its bottom peripheral surface, and a cavity recessed therein from the periphery of said radial bore and adapted to receive therein said latch pin when the stub shaft of said support base is inserted into said radial bore in said spherical body.

4,433,855

SNOW SKI

Paul R. Wyke, c/o Holmgren, 2809 "R" St. SE., Auburn, Wash. 98002

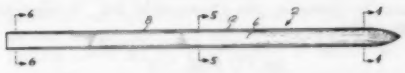
Continuation-in-part of Ser. No. 145,569, Jun. 6, 1980, abandoned. This application Sep. 8, 1981, Ser. No. 299,883

Int. Cl.³ A63C *5/04*

U.S. Cl. 280—609 **14 Claims**

1. A snow ski having essentially parallel lower side edges that bite into snow, and a running surface between said edges which has a transverse shape that changes gradually from the

front end of the running surface to the rear of the ski and which is transversely concave in the front and central regions of the ski, the concavity in said front and central regions being greatest at said front end and decreasing gradually rearwardly through said front and central regions in a manner that provides a low overall angle of attack and a smooth, almost tangential entry of the ski into snow to facilitate flow of snow



beneath the ski and move the center of lift rearward toward the skier, and said transverse shape further decreasing in concavity rearward of said central region toward the rear of the ski to gradually reduce resistance to sideways sliding and thereby facilitate sideways sliding at the rear of the ski; said edges and running surface permitting a skier to easily turn the ski by merely tilting it up on one of said edges.

4,433,856

SPRING SEAT FOR SNOWMOBILE STRUT

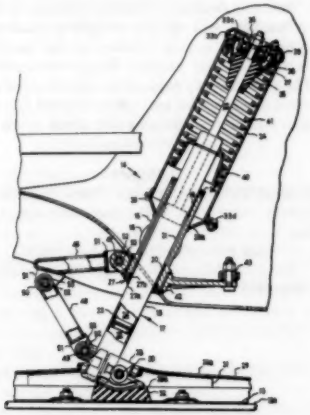
Keisuke Yoshida, Cypress, Calif., assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Continuation of Ser. No. 75,201, Sep. 12, 1979, abandoned. This application Nov. 16, 1981, Ser. No. 321,811

Claims priority, application Japan, Sep. 29, 1978, 53-120620; Nov. 30, 1978, 53-148508

Int. Cl.³ B60G *25/00*

U.S. Cl. 280—668 **15 Claims**



14. In a strut-type suspension for supporting part of the chassis of a vehicle, said suspension including a fixed tube mountable to said chassis, a bearing inside said fixed tube, a movable tube slidably mounted in said bearing, said movable tube and bearing having cylindrical engaging walls with respective axes, and being coaxial, said movable tube being slidably mounted in said bearing, the improvement comprising:

restraint means comprising a tubular member attached to said fixed tube and surrounding said movable tube above said fixed tube;

attachment means releasably attaching said restraint means to said fixed tube, said restraint means being structurally attached to said chassis only through said fixed tube; and

bias means opposed in compression between said movable tube and stucture axially restrained with respect to said fixed tube.

4,433,857

VEHICLE WITH INDIVIDUALLY SUSPENDED WHEELS

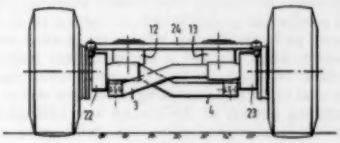
Albert Zwalve, F. Clockstraat 68, 9665 BD Oude Pekela, Netherlands

Filed Jul. 2, 1981, Ser. No. 279,851

Claims priority, application Netherlands, Jun. 22, 1981, 8103010

Int. Cl.³ B60G *3/00*

U.S. Cl. 280—690 **2 Claims**



1. A vehicle comprising a wheel set including at least two wheels, and a chassis frame which, as viewed in the normal direction of travel, includes a left-hand and a right-hand longitudinal member, from each of which an individually sprung wheel of said wheel set is suspended, via an arm, in a first pivot joint, both the left-hand wheel and the right-hand wheel having extended stub axles, the extensions of which cross each other and are pivotally suspended from said chassis frame in a second pivot joint adjacent to the opposite wheel of the wheel set, characterized in that the first and second pivot joints associated with each wheel form a composite pivot joint consisting of two concentric component pivots rotatable one about the other, with each composite pivot joint being connected to the respective longitudinal frame member either direct or by means of a bracket.

4,433,858

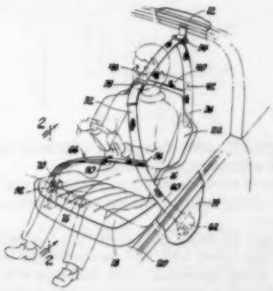
PASSIVE BELT RESPONSIVE TO SEAT OCCUPANCY

Edward F. Taylor, Farmington Hills, and James C. O'Kane, Warren, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 17, 1982, Ser. No. 349,620

Int. Cl.³ B60R *21/10*

U.S. Cl. 280—802 **1 Claim**



1. A passive restraint belt system for restraining an occupant upon a resilient foam seat bottom cushion movable between a depressed state of the weight of an occupant seated thereon and an undepressed state and mounted in a motor vehicle body having a door hingedly mounted for movement between open and closed positions comprising:

a shoulder belt disposed diagonally across the seat when the door is closed to restrain the occupant upper torso;

a lap belt having an inboard end mounted on the vehicle

body inboard of the seat generally adjacent the occupant hip and an outboard end attached to the shoulder belt so that the lap belt crosses the occupant lower torso when the shoulder belt is disposed in the diagonal restraining position;

a belt control arm of generally C-shape having an upper tubular sheath enclosing the lap belt and a lower operating portion integral with the tubular sheath and embedded in the resilient foam cushion; and

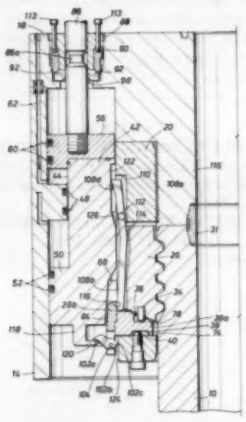
pivot means mounting the control arm on the seat adjacent to the inboard occupant hip whereby the occupant weight depressing the resilient foam cushion depresses the operating portion and pivots the belt control arm about the pivot means to lower the lap belt to the normal restraining position when the seat is occupied, said resilient foam cushion being restored to the undepressed state upon removal of the occupant weight from the seat so that the operating portion of the control arm embedded in the resilient foam is raised to pivot the belt control arm about the pivot means and thereby raise the tubular sleeve portion so that the lap belt is raised when the seat is not occupied.

4,433,859

WELLHEAD CONNECTOR WITH RELEASE MECHANISM

Gary R. Driver, and Richard J. Herman, both of Houston, Tex., assignors to NL Industries, Inc., New York, N.Y.

Filed Jul. 16, 1981, Ser. No. 284,008
Int. Cl.³ F16L *37/08*
U.S. Cl. 285—34 **18 Claims**



1. Apparatus for connecting a pair of tubular bodies in generally coaxial alignment, comprising:

a plurality of movable members carried by one of said bodies for generally radial extension and retraction with respect thereto;

drive means movably carried by said one body and operatively associated with said movable members, said drive means being operative, upon movement in a first direction, to radially extend said movable members;

and release means pivotally interengaged between said one body and said movable members when said movable members are so extended and operative, upon pivotal movement, to at least partially radially retract said movable members, said release means comprising a first set of levers each pivotally mounted on a respective one of said movable members and having a force-transmitting arm engagable with said one body and further having a force-receiving arm; and

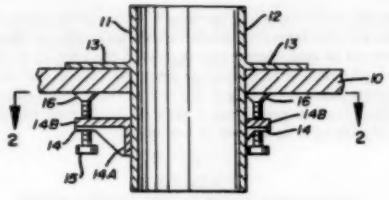
said drive means further being engagable with said force receiving arms and operative, upon movement in a second direction opposite to said first direction, to so pivotally move said first set of levers to at least partially radially retract said movable members.

4,433,860

ADJUSTABLE FLANGED FITTING FOR ROOF OPENINGS

William W. Lindquist, 190 Clarencedale Ave., Youngstown, Ohio 44512

Filed Oct. 20, 1980, Ser. No. 198,770
Int. Cl.³ F16L *5/00*
U.S. Cl. 285—192 **4 Claims**



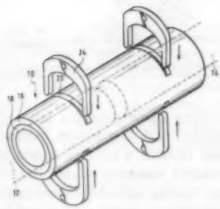
1. An adjustable flanged drainage fitting for roof openings consisting of a vertically disposed tubular member having upper and lower ends and having an integral horizontal disposed outwardly extending annular flange thereon below the upper end thereof, a plurality of radially extending brackets and means attaching said brackets to said tubular member between said annular flange and the lower end of said tubular member, vertically disposed threaded openings in said radially extending brackets, said radially extending brackets arranged in circumferentially spaced relation to one another and in spaced relation to said annular flange, vertically disposed threaded bolts threadably engaged in said threaded openings in said brackets arranged for movement toward and away from said annular flange in a clamping-like action when rotated.

4,433,861

ARRANGEMENT FOR CONNECTING TWO PIPE ENDS

Stefan Kreczik, Neudeck 3, 7101 Langen-Brettach, Fed. Rep. of Germany

Filed Feb. 16, 1982, Ser. No. 348,962
Int. Cl.³ F16L *37/00, 21/02, 13/14, 55/00*
U.S. Cl. 285—305 **17 Claims**



1. An arrangement for connecting two pipes which are insertable into one another with radial play and which are made of a material which is at least semi-rigid, characterized by two pipe ends of different diameter with the pipe end of smaller diameter inserted in the pipe end of larger diameter with a radial space between the two pipe ends, a packing sleeve arranged in said radial space between said two pipe ends and filling said radial space, the wall of the larger diametered pipe end having at least one radially outwardly open slot extending

transversely to the pipe axis, which slot extends around less than half of the circumference of said larger diametered pipe end, a groove defined internally of said larger pipe end and radially aligned with said slot, a generally horseshoe-shaped tension hoop associated with said slot and having legs extending into said groove, the thickness of said tension hoop in its axial extent corresponding to the axial width of said slot and which tension hoop is inserted in said radial space between said two pipe ends, and said tension hoop legs being inserted in said groove at least half of the circumference of the smaller diameter one of said pipe ends and sufficiently compressing said packing sleeve radially as so inserted to connect and axially retain said smaller diameter pipe relative to said larger diameter pipe.

4,433,862

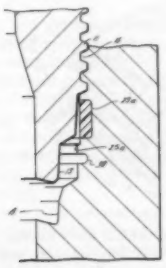
PIPE JOINT

George M. Raulins, and George G. Grimmer, both of Dallas, Tex., assignors to Otis Engineering Corporation, Dallas, Tex.

Continuation-in-part of Ser. No. 367,952, Apr. 13, 1982. This application Jan. 7, 1983, Ser. No. 456,526

Int. Cl.³ F16L *19/00, 25/00, 15/00*

U.S. Cl. 285—350 **20 Claims**



1. A pipe joint comprising,

a box having a tapered thread and an annular primary seal surface,

an annular seal groove in the box at the last thread,

an annular excess seal groove between the seal groove and primary seal surface,

an annular secondary seal surface between said two grooves,

a pipe having a tapered thread and an annular primary seal surface for sealing engagement with the primary seal surface of the box,

said pipe thread extending into said seal groove when the pipe joint is fully made up,

an annular secondary seal surface on said pipe between the thread and primary seal surface for engaging said secondary seal surface in the box prior to final make-up of the pipe joint, and

an annular seal member of compressible material in said seal groove,

said seal member originally of a volume in excess of the volume of the groove as defined by the pipe when the pipe joint is fully made up,

said box and pipe threads preventing substantial extrusion of said seal therethrough,

said seal during make-up being extruded past said secondary seal surfaces until said surfaces engage to provide a secondary seal and confine said seal for compression during final make-up of the pipe joint,

said excess seal groove receiving at least a part of said extrusion to prevent it from reaching said primary seal surfaces.

4,433,863

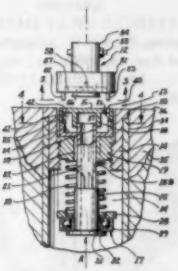
POOL NOZZLE HEAD REMOVING AND REPLACING TOOL

Lester R. Mathews, 9810 N. 37th St., Phoenix, Ariz. 85028, assignor to Lester R. Mathews; Lucien Warner and Water Circulation Patents, part interest to each

Filed Aug. 9, 1982, Ser. No. 406,757

Int. Cl.³ A47F *13/06*

U.S. Cl. 294—19 R **2 Claims**



1. A tool for removing a nozzle head having a substantially flat top surface from below the water level of a swimming pool in which said nozzle head is rotatably connected into a water supply receptacle and has spaced openings on the top surface thereof, said tool comprising a substantially cyclindrical body with first and second ends, lugs projecting in the axial direction from the first end of said cylindrical body for engaging the corresponding spaced openings in said nozzle head, a vacuum cup made of resilient material disposed on the first end of said body between said lugs for attachment to said nozzle head when said body is pushed toward said nozzle head and said lugs are received in the openings in the top surface in said nozzle head, and an elongated handle attached to the second end of said body for rotating, lifting, and replacing said head.

4,433,864

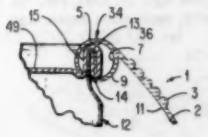
CAN TOP LID HOLDER

Franklin D. Byrd, 23 Elm St., Hinesville, Ga. 31313

Filed Aug. 18, 1982, Ser. No. 409,173

Int. Cl.³ A47J *45/00*

U.S. Cl. 294—27 H **9 Claims**



1. A device for holding a can with a top lip comprising:

a. a structure that can be held by the user of said device; and

b. a first holding area, with an inner area, the circumference of which is larger than the circumference of the cross-section of said top lip of said can, secured to said structure and operative to be secured onto said top lip of said can comprising:

(1) a first outer gripping finger secured to said structure and operative to fit over said top lip and against the inner surface of said top lip, hooking over said top lip and down and against said inner surface of said top lip and operative to apply a securing force to said inner surface of said top lip when said device is utilized and

said top lip of said can is within said first holding area; and

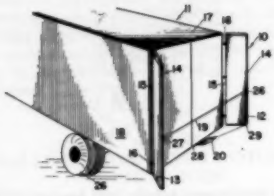
(2) a first inner gripping finger secured to said structure and operative to fit up, under, and against the bottom edge of said top lip, hooking under said bottom edge of said top lip and operative to apply an upward force to said bottom edge of said top lip when said device is raised vertically.

4,433,865

VEHICLE SWAY DAMPER

Edward E. Crompton, Jr., 906 W. Arlington Rd., Erie, Pa. 16509

Filed Apr. 14, 1982, Ser. No. 368,146
Int. Cl.³ B62D *35/00*
U.S. Cl. 296—1 S **11 Claims**



1. A flap system for a vehicle comprising,

a plurality of elongated plate-like flap members each having a first edge and a second edge,

hinge means attached to said first edge of each said flap and adapted to swingably connect said flaps to a first side and a second side respectively of a vehicle,

link means pivotally attached to said second edge of one said first flap and a second edge of said second flap,

said link means being connected to said flaps and adapted to hold said first edges of said flaps in spaced relation to each other,

means connected to at least one said flap at its second edge adapted to allow each said flap to swing freely in a first direction,

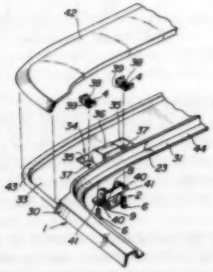
and to restrain the swinging movement of each said flap in a second direction.

4,433,866

STRUCTURE FOR MOUNTING FUNCTIONAL PARTS ON A CLOSABLE MEMBER OF A VEHICLE

Taro Hagiwara, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Apr. 16, 1981, Ser. No. 254,789
Claims priority, application Japan, Apr. 17, 1980, 55-49534
Int. Cl.³ B62D *25/12, 27/00*
U.S. Cl. 296—76 **7 Claims**



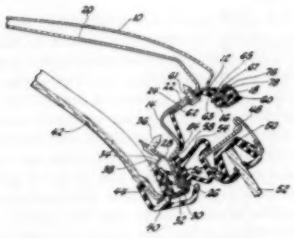
1. A structure for mounting functional parts on a closable member of a vehicle, wherein the closable member consists of a sheet material and has a predetermined location to mount thereon the functional parts and is provided with a reinforcing member, said location being defined by an emboss which is recessed from the general surface of the closable member toward the rear side thereof, the reinforcing member being provided on the outer surface of the emboss and the functional parts being mounted on the rear surface of the emboss, the closable member on the outer surface side of the emboss being provided with a cover member which completely covers the emboss and is coplaner with the general surface of the closable member, said reinforcing member being secured to the outer surface of the emboss by adhesive material, said functional parts being connected tightly with the reinforcing member by bolts and nuts, and said nuts being welded to one of the reinforcing member and the functional parts.

4,433,867

ROOF RAIL MOLDING MEMBER

William H. Perry, Rochester; David C. Stewart, Farmington Hills, and Geoffrey Waterworth, Troy, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 26, 1981, Ser. No. 314,559
Int. Cl.³ B60J *5/04*
U.S. Cl. 296—146 **3 Claims**



1. A roof rail molding for a vehicle body having a roof rail extending longitudinally above a door opening and having a flange pinch-welded to a juxtaposed flange of the roof outer panel, and a resilient compressible sealing strip suitably secured to the vehicle body inboard of the door opening for sealing engagement by a hingedly mounted door and having a sealing leg for sealing engagement with the roof rail, said molding comprising:

a plastic molding attached to the roof rail and facing downwardly to define the top edge of the door opening, said molding having an outboard edge portion defining a recess by which the molding is installed over the pinch-weld flange and defining a sealant cavity, said molding further having an inboard edge portion adapted to continuously overlie a portion of the sealing strip leg.

4,433,868

CAB FOR WALK-BEHIND TRACTOR

Lynn E. Hochwitz, Sheboygan Falls; Daniel W. Schaefer, Port Washington, and Michael L. Dawson, West Bend, all of Wis., assignors to Simplicity Manufacturing, Inc., Port Washington, Wis.

Filed Dec. 31, 1981, Ser. No. 336,330
Int. Cl.³ B62D *39/00*
U.S. Cl. 296—190 **7 Claims**

1. A cab for a walk-behind tractor that has a substantially upright handlebar support from the top of which handlebars project rearwardly and to opposite sides, said cab being characterized by:

A. A shroud member having

(1) a substantially U-shaped bottom wall with

(a) a front portion which can extend laterally across the handlebar support in front of the same and

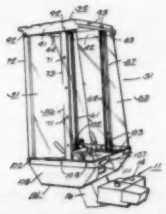
(b) opposite side portions that project rearward from said front portion to be disposed at opposite sides of the handlebar support,

(2) a front wall projecting upward from the front edge of said front portion of the bottom wall, and

(3) a pair of opposite upwardly projecting side walls, each extending rearward from an end of said front wall and all along an outer edge of one of said side portions of the bottom wall;

B. A pair of elongated clamping members, each projecting laterally inwardly from one of said side walls and each having clamping means at an inner end thereof for securement to one of the handlebars;

C. A pair of elongated brace legs, each having a first connection at an upper end thereof to said front wall and projecting



obliquely rearward and downward therefrom to have a second connection at its other end to the handlebar support, said legs being laterally spaced apart to have their said second connections at opposite sides of the handlebar support;

D. A pair of transparent side panels, each connected near a lower edge thereof with one of said side walls of the shroud member and projecting upward therefrom;

E. A transparent front panel connected near a lower edge thereof with said front wall of the shroud member; and

F. A top having

(1) a downwardly projecting front edge connected with an upper edge portion of said front panel, and

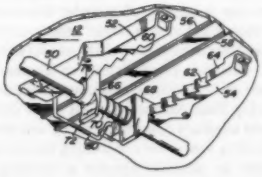
(2) a pair of opposite downwardly projecting side edges, each connected with an upper edge of one of said side panels.

4,433,869

BABY WALKER

Rex E. Payne, Jr., Elverson, and Ronald R. Hoffman, Morgantown, both of Pa., assignors to Dawn Designs, Inc., Elverson, Pa.

Filed Dec. 15, 1980, Ser. No. 216,593
Int. Cl.³ A47D *13/04*; A61H *3/04*; A63C *3/04*
U.S. Cl. 297—5 **10 Claims**



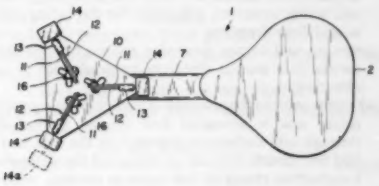
1. A baby walker comprising a tray and seat adjustable as a unit vertically with respect to a base by connecting means extending therebetween, at least one rack fixedly mounted to a bottom surface of said tray, said rack having teeth, a pawl slideably supported with respect to said connecting means adjacent said rack, said pawl having at least one tooth spring biased into meshing contact with at least one tooth on said rack, said meshed teeth being shaped so that said tray and seat can be elevated with respect to said base by applying only an upward force on the tray.

4,433,870

COLLAPSIBLE SPORTSMAN'S STOOL

Donald J. Bairen, 856 McLaughlin Rd., and Thomas M. Lucas, 725 Chartiers St. (rear), both of Bridgeville, Pa. 15017

Filed May 29, 1981, Ser. No. 268,564
Int. Cl.³ A47C *4/00*
U.S. Cl. 297—16 **1 Claim**



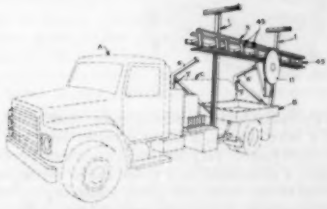
1. A collapsible stool for sportsmen and the like comprising telescoping tubes having adjusting means for selectively adjusting the amount of extension and height of said tubes, a stool pivotally connected at the top end of one of said tubes and collapsible so as to be positioned alongside said tubes, a base connected at the bottom end of the other of said tubes, pivotal means for pivoting and collapsing said base so as to extend alongside the bottom portion of said tubes, said base including a platform to prevent sinking of said tubes into wet ground, runner-like strips integrally depending vertically from the bottom surface of said platform and having bottom inturned flanges adjustable runner-like strip extensions having lengths comparable to the length of said strips and being slidably mounted on said flanges and alongside said strips to facilitate sliding or sinking in mud to allow said base to lie on the ground surface, and foot pads depending from the extremities of said extensions to adjust the length of said extensions to provide a firm support for said platform.

4,433,871

MACHINE FOR CUTTING CURBSTONES, SIDEWALLS AND THE LIKE

Rene Bertrand, 648 Lasalle, St. Jean, Quebec, Canada J3B 2R2

Filed Jun. 17, 1982, Ser. No. 389,572
Int. Cl.³ E01C *23/09*
U.S. Cl. 299—41 **15 Claims**



1. A machine including a powered truck-like vehicle having a support base at the rear and an apparatus mounted thereon for cutting a drive-in passage across a concrete curbstone, a sidewalk or the like, said apparatus comprising:

two spaced parallel booms mounted at one end on said base and an elongated bridge structure extending between said booms perpendicularly thereto and connected to said booms for displacement therealong relative to said one

end of said booms, and means for displacing said structure along said booms,

means pivoting said booms and bridge structure together from an inoperative position where said bridge structure stands above said support base to an operative position where said booms and bridge structure are swung outwardly of said support base for cutting a curbstone, sidewalk or the like;

a carrier having a concrete-cutting rotary saw thereon for rotation about an axis generally normal to said carrier, and means mounting said saw on said carrier;

means mounting said carrier on said bridge structure for displacement thereof in a first direction along one face of said bridge structure, and means for displacing said carrier in said first direction;

means on said carrier mounting means, for displacing said carrier in a second direction perpendicular to said first direction;

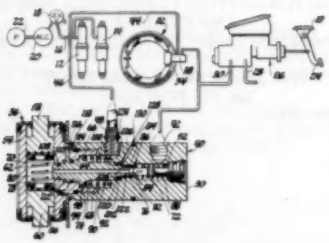
whereby, with said apparatus in said operative position, said rotary saw is advanced first in said second direction through said curbstone, sidewalk or the like, and then in said first direction to cut an elongated slot determining the longitudinal extent of said drive-in passage, wherein said bridge structure has a central section and, at either end thereof, a terminal section; means pivotally mounting said terminal sections at the ends of said central section and means pivoting said terminal sections upwardly with respect to said central section selectively to place said terminal sections at an incline suitable to displace the said carriage and saw along a slope corresponding to said incline for cutting said curbstone, sidewalk or the like whereby to produce terminal inclined extents for said drive-in passage, said inclined extends joining said longitudinal extent.

4,433,872

PRESSURE MODIFIED BRAKE ACTUATING PRESSURE PROPORTIONER

Donald L. Parker, Middletown, and Hubert Hogg, Hamilton, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 9, 1981, Ser. No. 319,685
Int. Cl.³ B60T 8/22
U.S. Cl. 303—22 A **2 Claims**



1. In a hydraulic brake pressure proportioner having a housing with a bore therein, a brake pressure inlet and a brake pressure outlet respectively communicating with opposite ends of said bore, a differential area proportioner piston reciprocably received in said bore, and spring means urging said piston in a non-proportioning direction and yielding under sufficient outlet brake pressure acting on said proportioner piston to permit piston proportioning action to proportion outlet brake pressure relative to inlet brake prssure, the improvement comprising:

a fluid pressure chamber positioned in said housing between said inlet and said outlet and defined by a part of said bore and a part of said piston, said piston having an effective piston differential area exposed to variable fluid pressure in said chamber to generate a force variable with said variable fluid pressure and acting with said spring means on said piston to increase the outlet brake pressure value at which said piston proportioning action can begin in accordance with the increase in fluid pressure in said chamber:

first and second vent means in said housing respectively between said chamber and said brake pressure inlet and said chamber and said brake pressure outlet;

and sealing means sealing said piston relative to said bore on each side of each of said first and second vent means;

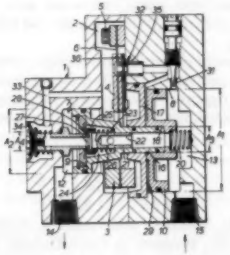
said sealing means and said vent means assuring the venting of any fluid from said fluid pressure chamber or said brake pressure inlet or said brake pressure outlet and effectively preventing the mixture of any brake pressure fluid with any variable pressure chamber fluid.

4,433,873

CONTROL VALVE ASSEMBLY

Glyn P. R. Farr, Warwick, Great Britain, assignor to Lucas Industries Limited, Birmingham, England

Filed Aug. 31, 1981, Ser. No. 298,191
Claims priority, application United Kingdom, Aug. 29, 1980, 8028069
Int. Cl.³ B60T 8/16
U.S. Cl. 303—24 A **9 Claims**



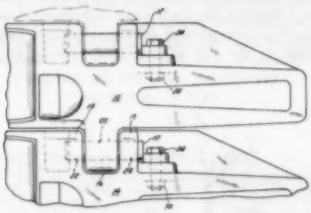
1. A brake pressure control valve for location between a source of brake actuating fluid and the wheel brakes of a vehicle to control the fluid pressure applied to said wheel brakes during brake application, the control valve comprising: an inlet chamber the pressure within which is under driver control; an outlet chamber connected to said wheel brakes; control piston means exposed to the pressures prevailing in said inlet chamber and said outlet chamber respectively; an auxiliary control chamber bounded on one side by said control piston means; a source of operating fluid connected at all times during brake application to said auxiliary control chamber; and deceleration responsive vent valve means for controlling the venting of the auxiliary chamber to establish therein a working pressure dependent on vehicle deceleration, said vent valve means including a fixed vent valve seat and a deceleration responsive member which, upon sensed deceleration, engages the vent valve seat to close the vent valve means thereby allowing pressure within the auxiliary control chamber to increase until such pressure acting over the area of the vent valve seat overcomes the force with which the deceleration responsive member is urged by the sensed deceleration against the vent valve seat.

4,433,874

CRAWLER SHOE HAVING WORK-HARDENED PIN-RECEIVING HOLE

Raymond C. Melvin, Elm Grove, Wis., assignor to Harnischfeger Corporation, Brookfield, Wis.

Filed Feb. 11, 1982, Ser. No. 347,897
Int. Cl.³ B62D 55/20
U.S. Cl. 305—53 1 Claim



1. As an article of manufacture:

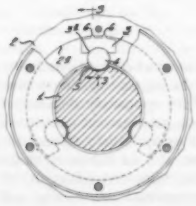
a crawler shoe for a mining shovel or the like, said shoe having an outer surface and having a portion in which a cylindrical hole is provided for receiving a pin which pivotally connects the shoe to an adjacent shoe, said shoe being fabricated of work-hardenable Hadfield-manganese steel alloy, said outer surface of said shoe being work-hardenable, and the wall of said hole being work-hardened by rolling a rotatable member thereagainst so that the steel alloy defining and adjacent the hole is compressed to a predetermined depth on the order of one-tenth of an inch and to a predetermined degree of hardness on the order of 45 on the Rockwell "C" hardness scale from an initial untreated degree of hardness on the order of 23 on the Rockwell "C" hardness scale.

4,433,875

TORQUE TRANSMITTING BEARING AND METHOD OF ASSEMBLY

Lothar Walter, Schweinfurt; Manfred Braudenstein, Eussenheim; Horst M. Ernst, Eltingshausen, and Armin Olschewski, Schweinfurt, all of Fed. Rep. of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Aug. 16, 1982, Ser. No. 408,440
Claims priority, application Fed. Rep. of Germany, Aug. 17, 1981, 8124026[U]
Int. Cl.³ F16C 29/04
U.S. Cl. 308—6 R 3 Claims



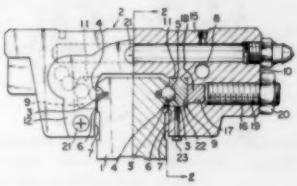
1. Torque transmitting bearing assembly comprising a shaft member mounted for axial movement in the bore of a housing, a plurality of rolling elements in the annular space between the shaft member and housing bore, said shaft member having an axially extending inner raceway groove for the rolling elements and a bearing race plate engageable between the rolling elements and the bore of the housing and having an axial groove defining the outer raceway for the rolling elements and at least a pair of radial projections disposed on opposite sides of a radial plane through the center of said axial groove and each projection having a longitudinally extending knife-like edge confronting the housing bore extending in the direction of said axial groove and engageable in the bore surface to align the bearing race plate and to fix the same in a radial and peripheral direction so that torque can be transmitted in either direction upon relative rotation of said shaft and housing, said projections comprising a plurality of sections longitudinally spaced apart, the sections increasing in radial height from one end of said plate to the opposite end thereof.

4,433,876

ROLLING BEARING FOR LINEAR MOTION

Tatsuo Mottate, Yokohama, Japan, assignor to Nippon Thompson Co., Ltd., Tokyo, Japan

Filed Aug. 20, 1981, Ser. No. 294,766
Claims priority, application Japan, Mar. 12, 1981, 56-35816; Apr. 14, 1981, 56-53509
Int. Cl.³ F16C 29/06
U.S. Cl. 308—6 C 6 Claims



3. A rolling bearing for linear motion wherein a slide unit is mounted on a track rail, track plates having track surfaces facing track surfaces on both sides of the track rail are fitted symmetrically left and right at channel shaped inside surfaces of said slide unit, and the slide unit is capable of making a linear motion against the track rail through rolling bodies mounted between the track surface of said track plate and the track surface of said track rail, characterized in that:

on said track rail side, there are provided in the horizontal direction at the vertical left and right outside surfaces, a pair of track surfaces where a group of balls roll, while, on the slide unit side where it faces said track surfaces, at the vertical left and right inside surfaces there are provided in the horizontal direction a pair of track surfaces where the group of balls roll, said both track surfaces are constructed respectively by an upper half track surface and a lower half track surface, said truck surfaces of said track rail and of said slide unit make contacts with the ball only at respective contact points of slide unit upper contact point which is located at the upper half track surface of the track surface of the slide unit and of track rail lower contact point which is located at the lower half track surface of the track surface of the track rail, both being symmetric each other to the center of the ball, and of slide unit lower contact point which is located at the lower half track surface of the track surface of the slide unit and of track rail upper contact point which is located at the upper half track surface of the track surface of the track rail, both being symmetric each other to the center of the ball, the track surfaces of said track rail and said slide unit are constructed so that said slide unit upper contact point and said track rail lower contact point are located symmetrically to the center of the ball with an angle less than 45° from the vertical plane passing through the center of the ball, and also said slide unit lower contact point and said track rail upper contact point are located symmetrically to the center of the ball with an angle more than 45° from the vertical plane passing through the center of the ball, at least one of the track plates of said slide unit is fitted onto the slide unit main body so that it can advance

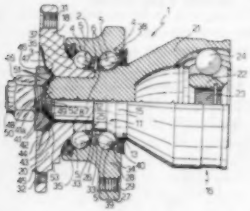
or retract against the corresponding track surface of the track rail, a threaded hole passes through on the slide unit main body from the outer surface towards said track plate, the end of a preload bolt screwed in said threaded hole makes contact with a plug fitted slidably in the axial direction of said threaded hole, and that said plug is caused to make pressure contact at its plane of end face with a similar plane at the back portion of the track surface.

4,433,877

SUPPORT ASSEMBLY FOR VEHICLE WHEELS

Franco Colanzi, Turin, Italy, assignor to RIV-SKF Officine Di Villar Perosa SpA, Turin, Italy

Filed Feb. 18, 1982, Ser. No. 349,703
Claims priority, application Italy, Feb. 27, 1981, 67267 A/81
Int. Cl.³ F16C *19/08, 33/60;* **F16D** *1/06*
U.S. Cl. 308—191 **11 Claims**



1. A support assembly (1) for a vehicle drive wheel, comprising a dual track inner race provided with a removable inner race end section (3) which has a support flange (18) for said wheel and one annular track for a set of rolling bodies, a dual track outer race (2) facing the inner race and provided with a flange (27) adapted to engage an upright of a suspension for said wheel, a set of rolling bodies (4, 5) in each track, the rolling bodies of each set supported in place by an annular spacer cage disposed between said two races (23), the tracks (6, 8) of said races being longitudinally offset to accommodate both axial and radial loads, said removable inner race end section (3) being mounted on an element (21) which transmits motion to said wheel, the element having a journal section (15) with an end cylindrical surface (56) arranged to support a corresponding inner surface of the removable inner race end section (3) and a locking ring assembly (46, 50) for holding the removable inner race end section immovably in position on the journal, the outer end surfaces (42, 43) of the removable inner race end section (3) and the journal section (15) having gripping elements, and the locking ring assembly having interfitting elements (51) for simultaneously engaging the gripping elements of both the removable inner race end section and the journal whereby the removable inner race end section (3) can be readily installed and removed and held immovably in position on the journal by the locking ring assembly after mounting.

4,433,878

SELF-ALIGNING BEARING ASSEMBLY

Ben J. Rosenthal, Wilmette, Ill., assignor to Rosenthal Manufacturing Co., Inc., Chicago, Ill.

Filed Sep. 29, 1982, Ser. No. 428,370
Int. Cl.³ F16C *13/00, 35/00;* **F16J** *1/14*
U.S. Cl. 308—203 **7 Claims**

1. A self-aligning bearing assembly for engaging, supporting, and permitting the free rotation of, the end of a load bearing shaft, said self-aligning bearing assembly comprising:

a sub-base having a top and a bottom;

a supporting sub-assembly being located above said sub-base, said supporting sub-assembly having a base and roller means for supporting the end of said load bearing shaft and permitting the free rotation thereof;

alignment means operatively engaging and disposed between the top of said sub-base and the base of said supporting sub-assembly for directly transferring the load supported by said supporting sub-assembly to said sub-base while permitting said supporting sub-assembly to tilt in relation to said sub-base;

said alignment means comprising a pair of parallel, juxtaposed channels, the first one of said channels located in the base of said supporting sub-assembly and having its axis normal to the axis of said load bearing shaft, and the

second one of said channels located in the top of said sub-base, and an alignment shaft located within and between said channels; and

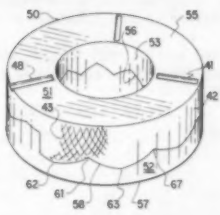
said alignment means further comprising at least two stabilizing members, said stabilizing members fixedly attached to said base of said supporting sub-assembly, one each of said stabilizing members attached to said base on each side of said channels, each of said stabilizing members further having damping means for operatively connecting each of said stabilizing members to said sub-base whereby tilting of the supporting sub-assembly in relation to said sub-base is damped.

4,433,879

ADJUSTABLE EXTENSION-CAM SHIM

James C. Morris, 9860 Ravenna Rd., Twinsburg, Ohio 44087

Filed Apr. 2, 1981, Ser. No. 250,320
Int. Cl.³ F16C *33/00;* **F16B** *41/00*
U.S. Cl. 308—244 **1 Claim**



1. A shim comprising a first cam axially longitudinally interfitted with a second cam, said first cam having an end with a planar surface and an oppositely disposed end having a serrated helical surface, said second cam having an end with a planar surface and an oppositely disposed end having a serrated helical surface, at least one ramp in serrated helical surface of each cam, said ramp comprising plural, stepped circumferential serrations provided in said ramp, said serrations being in vertically stepped relationship one with another and terminating in a wall demarcating the highest serration from the lowest in said helical surface, said serrations of said first cam being complementarily interfitted with said serrations of said second cam, at least one surface of at least one cam having at least one adjustment means thereon, both said first and second cam having an axial bore hole and terminating in a relief at said planar surface of said cams, said cams being loosely coupled by a shaft having a flanged portion at each end, said shaft being

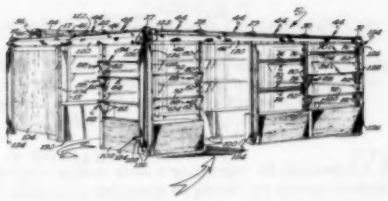
shorter in length than the minimum thickness of said shim with said serrated surfaces in full engagement, and said reliefs being deep enough to allow said first cam and said second cam to be separated sufficiently to allow adjustment to the maximum thickness of said shim.

4,433,880

FREE STANDING MODULAR UNIT FOR STORING, DISPLAYING, AND SELLING MERCHANDISE

William S. Maravelas, Jr., Maple Grove; Alexandria D. Bighley, Arden Hills, and Marco A. Calabrese, Minneapolis, all of Minn., assignors to Deck the Halls, Inc., Roseville, Minn.

Filed Sep. 20, 1982, Ser. No. 420,421
Int. Cl.³ A47F *3/14*
U.S. Cl. 312—3 **11 Claims**



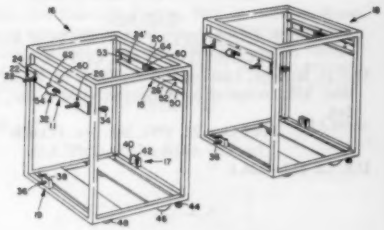
1. Free standing modular unit for storing, displaying, and selling merchandise comprising, in combination: a plurality of elongated posts having top ends and bottom ends, with some of the posts being perimeter posts and some of the posts being interior posts, with some of the perimeter posts being corner posts; a plurality of members for separating and connecting the posts, with the post separation and connector members having first and second ends; means for providing visually hidden locking between the ends of the post separation and connector members and the elongated posts adjacent their top ends without the use of tools, with the visually hidden locking means comprising at least a first hook extending from either the end of the post separation and connector member or the post adjacent the top end and a complementary aperture formed in the other of the separation and connector member or the post for receipt of and interlocking with the hook; a generally open ceiling which allows water to pass therethrough, which presents an aesthetic appearance, and which can be assembled in the modular unit without the use of tools comprising: lattice grids formed of intersecting elongated strips having free ends, and with the post separation and connector members including lips for receipt of and supporting the free ends of the intersecting elongated strips forming the lattice grids; means for selectively closing the perimeter surface of the modular unit without requiring fire doors or draft curtains comprising: flexible coverings formed of non-combustible or fire treated materials; and means for rolling and unrolling the covering from an unrolled positioned closing the perimeter surface of the modular unit to a rolled position adjacent the top ends of the elongated perimeter posts; merchandise storing, displaying and holding members; means for attaching the merchandise storing, displaying and holding members to the posts comprising: apertures formed in the elongated posts between their top and bottom ends; apertures formed in the merchandise storing, displaying, and holding members; and dowels having a size and length for passing through the apertures of the merchandise storing, displaying, and holding members and into the apertures of the elongated posts to interlock the merchandise storing, displaying and holding members to the elongated posts; with at least two adjacent perimeter posts having a unit access opening; means for preventing the coverings from damaging the merchandise storing, displaying and holding members and the merchandise located thereon comprising perimeter edge extenders located at least on the corner posts of the unit having top and bottom cam contoured edges and an elongated side for engaging with the covering in its unrolled position; and the posts, the post separation and connector members, the intersecting strips forming the lattice grids, the merchandise storing, displaying and holding members, the dowels, and the perimeter edge extenders being formed of non-combustible or fire treated materials so that the modular unit is safe from fire.

4,433,881

CONNECTING MECHANISM FOR WORD PROCESSOR-CONTROLLED PRINTER OUTPUT MODULE CABINETS

Franklyn H. Witten, and Sherman S. Kline, both of San Antonio, Tex., assignors to Datapoint Corporation, San Antonio, Tex.

Filed Nov. 16, 1981, Ser. No. 321,807
Int. Cl.³ A47B *81/00*
U.S. Cl. 312—107.5 **3 Claims**



1. A connecting and aligning mechanism for a word processor-controlled printer having output module cabinets with facing adjacent wall members comprising:

first positioning means mounted on a first portion of said facing adjacent wall members of output module cabinets comprising a docking channel member mounted on a first modular cabinet and having laterally spaced first and second male aligning members, and a second docking channel member mounted on a second modular cabinet and having laterally spaced first and second female aligning apertures for mating with said first and second male aligning members for connecting the output module cabinets;

a latching pin mounted in said first docking channel member;

a latching member including a spring biased rotatable hook means mounted in said second docking channel member for engaging said latching pin; and

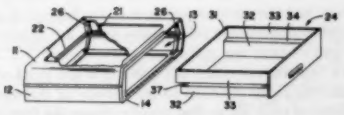
second positioning means mounted on a second portion of said facing adjacent wall members of said output modular cabinets vertically spaced from the first portion comprising a male positioner mounted on said first modular cabinet and a female positioner mounted on said second modular cabinet.

4,433,882

MODULAR, STACKABLE, SUSPENDABLE DRAWER CABINET

George L. Brown, 419 E. N St., Benicia, Calif. 94510

Filed Mar. 26, 1982, Ser. No. 362,552
Int. Cl.³ F16B *12/00*; A47B *88/00*
U.S. Cl. 312—111 **9 Claims**



1. A modular drawer cabinet adapted for vertically stacked assembly, comprising a thin, non-load-bearing cabinet shell defining a generally rectangular, hollow, closed solid having

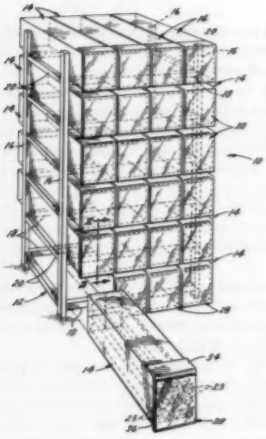
one open end and four vertically extending vertices, a drawer disposed within said cabinet, means for supporting said drawer in translatable fashion from said open end of said cabinet, means for transferring the weight load of said drawer and its contents directly to adjacent stacked modular drawer cabinets, said last mentioned means including a plurality of corner braces, each extending generally vertically within said cabinet and disposed in one of said vertices, means for connecting the corner braces of vertically adjacent modular drawer cabinets without applying said weight loads to the respective cabinets, said means for supporting said drawer including drawer track means disposed within said cabinet and supported by said corner braces.

4,433,883

STORAGE AND DISPLAY SYSTEM FOR ROLLS OF DECORATIVE WALL COVERING

Carl H. Boender, Lansing, Ill., and Roger M. Zigterman, Highland, Ind., assignors to Wallpapers Galore, Inc., Hammond, Ind.

Filed Oct. 22, 1981, Ser. No. 313,650
Int. Cl.³ A47B *47/00*; G09F *3/00*
U.S. Cl. 312—234.1 **3 Claims**



1. A storage and display system for holding rolls of decorative wall coverings and the like comprising, in combination:

(a) a support frame having vertical members at its corners, and horizontal members at its front, rear and sides to define a plurality of shelves;

(b) a row of bins on each shelf, each bin comprising a horizontally elongated parallelepiped made from corrugated cardboard and having a substantially rectangular cross-section and opening at its front end, each bin being placed across the shelves so that the vertical walls of adjacent bins and the vertical members of the support frame are in close, side-by-side relationship so as to support the contents of each bin; and

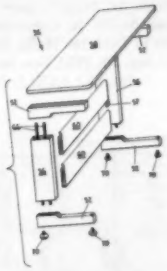
(c) a flap sized to cover the opening at the front of the bind and hingedly attached to the outside of the top near the front of each bin so that gravity causes the flaps to overlie the opening of its bin, said flap having a clear pocket on its outer surface open along its upper edge so that a sample of the wall covering stored within each bin can be displayed therefrom.

4,433,884

WORK SURFACE SUPPORT SYSTEM

Thomas M. Edwards, Wyoming; James O. Kelley, Spring Lake, and Michael D. Beard, Hudsonville, all of Mich., assignors to Herman Miller, Inc., Zeeland, Mich.

Filed Aug. 10, 1981, Ser. No. 291,770
Int. Cl.³ A47B *91/00*
U.S. Cl. 312—256 **18 Claims**



16. An assembly for supporting a work surface comprising:

a hollow vertical leg having an elongated rectangular horizontal cross-section which is uniform in dimensions throughout the length thereof;

a first hollow bracket member including an extension arm disposed generally perpendicular to the longitudinal axis of said leg for mounting to an underside of a work surface and a base portion collinearly arranged with said leg for mounting to said vertical leg, a bottom surface of said base being congruent with an upper edge of said hollow vertical leg;

a second hollow bracket having an upper surface portion of a shape congruent with said rectangular cross-section of said hollow vertical leg, said upper surface portion being in contact with a lower edge of said hollow leg; and

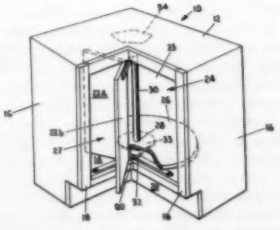
means extending from said first bracket to said second bracket through said hollow leg for securing said vertical leg to said first and second bracket members.

4,433,885

LAZY SUSAN ASSEMBLY HAVING A ROTATIONAL AND VERTICAL ADJUSTMENT MECHANISM

Clayton C. Baker, Belding, Mich., assignor to Leslie Metal Arts Company, Grand Rapids, Mich.

Filed May 22, 1981, Ser. No. 266,381
Int. Cl.³ A47B *81/00*; A47F *3/10*
U.S. Cl. 312—305 **26 Claims**



1. In a rotary catch mechanism for a shaft supported in a housing by bearings for rotation about a vertical axis, said mechanism including:

a cam having a notch in a peripheral surface thereof and mounted for rotation with said shaft;

a follower including means selectively received in said notch

for maintaining said shaft in a selected at rest rotary position relative to said housing;

the position of said follower being adjustable with respect to said housing; and

means for adjusting the selected at-rest rotary position of said shaft relative to said housing;

the improvement in said shaft-adjusting means which comprises:

mounting means for pivotably mounting said follower to said housing for pivoting movement about an eccentric axis;

wherein pivoting of said follower about said eccentric axis adjusts the angular position of the follower with respect to said housing, thereby changing the selected at-rest rotary position of said shaft relative to the housing.

4,433,886

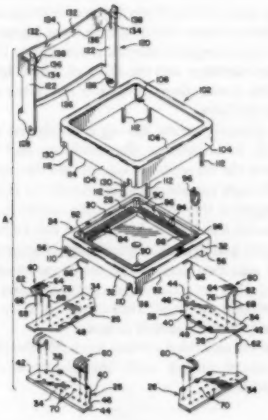
CONNECTOR MOUNTING FOR INTEGRATED CIRCUIT CHIP PACKAGES

James W. Cassarly; Robert W. Rollings, both of Huntingdon, and Frank C. Youngfleish, Pennsylvania Furnace, all of Pa., assignors to Elco Corporation, El Segundo, Calif.

Filed Dec. 17, 1981, Ser. No. 331,619

Int. Cl.³ H01R *23/70*

U.S. Cl. 339—14 R **27 Claims**



1. A connector mounting for an integrated circuit chip package having a plurality of electrical circuit contacts around the periphery of the underside of the terminal board thereof and a centrally located heat sink mounted on and upstanding from the upper side of the terminal board and overlying a substantial portion of the surface area thereof, said mounting comprising a plastic housing having an upwardly opening housing recess in its upper side defined by vertical inner side walls of said housing and a horizontal bottom wall, said recess conforming to the outer configuration of said terminal board and adapted to receive and position said chip package in said recess with its said circuit contacts facing downwardly, a plurality of electrical contact members secured in said housing within respective cavities therein and having flexible spring contact arm portions extending laterally inward through window openings in said housing recess side walls and into and exposed within the housing recess, said contact members also having rigid contact pin portions projecting downwardly in parallel relation from the bottom side of said housing, and a clamp member mounted on said housing and engaging and clamping said chip package in said housing recess with the said circuit contacts of said package pressed against and in electrical contact with the said spring contact arm portions of respective ones of said contact members, said clamp member comprising a frame member including a pair of elongated parallel side wall members joined together approximately at their opposite ends by a pair of parallel narrow transverse tie strap members, said side wall members being located entirely outward of said housing and extending closely alongside opposite outer sides thereof and defining with said tie strap members an unobstructed opening therebetween exposing substantially the entire upper side of said chip package, except for the relatively narrow band portions thereof covered at the opposite ends of the chip package by the said tie strap members, for the accommodation within said opening of the said upstanding heat sink on said chip package.

4,433,887

ADJUSTABLE AND READILY SOLDERABLE SHEET-LIKE CONNECTORS

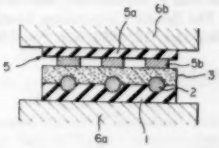
Ryoichi Sado, and Kazutoki Tahara, both of Saitama, Japan, assignors to Shin-Etsu Polymer Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 189,326, Sep. 22, 1980, abandoned. This application Sep. 30, 1982, Ser. No. 432,063

Claims priority, application Japan, Oct. 4, 1979, 54-137749

Int. Cl.³ H01R *7/02*

U.S. Cl. 339—17 R **9 Claims**



1. An adjustable and readily solderable sheet-like connector which comprises:

(a) a sheet-like body made of an electrically insulating elastic material,

(b) a plurality of wires made of a plastically deformable soft metal or alloy susceptible to soldering provided as integrally bonded to the sheet-like body in a planar arrangement running substantially in parallel with each other, at least part of the surface of each of the wires being not embedded in the sheet-like body forming a set of parallel electroconductive paths on the surface of the sheet-like body, and

(c) a soldering layer at least partly covering the surfaces of the wires at the portions not embedded in the sheet-like body which is made of a composite material composed of a matrix of a plastically flowable material and particles or chopped fibers of a solder alloy dispersed therein.

4,433,888

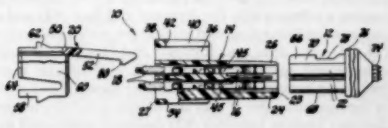
PRINTED CIRCUIT EDGEBOARD CONNECTOR WITH MULTI-FUNCTION LOCK

James L. Winger, Warren, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 6, 1982, Ser. No. 395,503

Int. Cl.³ H01R *23/56*

U.S. Cl. 339—91 R **2 Claims**



1. A printed circuit edgeboard connector comprising:

a connector body having two rows of terminal cavities, lateral slot means at one end of the connector body disposed

between the two rows of terminal cavities and communicating with the cavities in each row,

said lateral slot means extending through a side wall of the connector body,

a pair of parallel slots in an opposite end of the connector at the outer ends of the respective rows of terminal cavities,

said parallel slots extending through a side wall of the connector body and communicating with a transverse slot outside the side wall formed by a shroud at the opposite end of the connector body, and

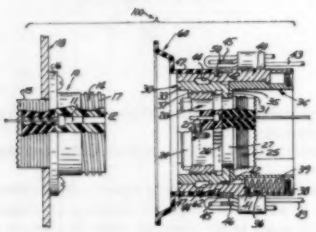
a multi-function lock comprising a U-shaped body and a flexible lock arm integrally attached to a center leg of the U-shaped body,

said multi-function lock being disposed in the parallel and transverse slots so that the flexible lock arm projects out of said shroud alongside the one end of the connector body and overlies the lateral slot means extending through the side wall of the connector body.

4,433,889
ELECTRICAL CONNECTOR HAVING A MOISTURE SEAL

Lloyd G. Ratchford, Oneonta; Dee A. Werth, Afton; Vincent A. Luca, Jr., and Alan L. Schildkraut, both of Sidney, all of N.Y., assignors to The Bendix Corporation, Southfield, Mich.

Filed Dec. 28, 1981, Ser. No. 334,866
Int. Cl.³ H01R *13/52*
U.S. Cl. 339—94 M **6 Claims**



1. A releasing electrical connector having a moisture seal, the releasing electrical connector including a pair of connector members (**10**, **20**) with each having, respectively, a forward end portion (**14**, **24**), a duality of electrical contacts (**11**, **21**) carried by said connector members and forming an electrical interconnection, and means (**30**, **34**, **40**, **39**, **37**, **17**) for releasably coupling the connector members, one of the connector members (**10**) being mounted in a panel (**18**) and having its forward end portion (**14**) extending therefrom and mated with the forward end portion (**24**) of the other connector member (**20**), the releasable coupling means including an operating sleeve (**40**) disposed about the mated end portions (**14**, **24**), said moisture seal characterized by:

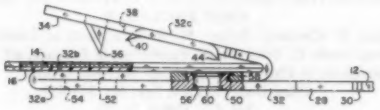
said operating sleeve (**40**) having an annular cavity (**50**) disposed in the outer surface thereof; and

a resilient seal member (**60**) including a tubular portion (**66**), a collapsible cup portion (**64**), and a hinge-like connection therebetween defined by each said portion having an end portion (**71**, **73**) of reduced thickness being connected together, said cup portion including a foot portion (**67**) having a substantially flat forward end face (**61**) and said cup portion being disposed around the mated end portions (**14**, **24**) such that said forward end face (**61**) thereof is compressed against the panel (**18**), said tubular portion (**66**) being arranged snugly about the forward end portion of the operating sleeve (**40**) and having a radially inwardly directed annular shoulder (**62**) disposed within said annular cavity (**50**) in said operating sleeve (**40**), said foot portion (**67**) further having a chamfered end face (**63**) extending from said flat end face (**61**) with said end faces (**61**, **63**) being adapted to flatten against the panel (**18**), said connector members being coupled together causing the cup (**64**) to collapse about the panel (**18**) and the second end face (**63**) to flatten against the panel.

4,433,890
CONNECTORS FOR FLEXIBLE PRINTED CIRCUITS AND METHOD THEREFOR

Vincent E. Marino, 7 Jacqueline Ct., Port Jefferson Station, N.Y. 11776; Robert J. Nicola, 107 Atlantic Ave., West Sayville, N.Y. 11796; Karl Maier, 29 Eva La., Farmingville, N.Y. 11738, and Richard W. Stockinger, 790 Sycamore Ave., Bohemia, N.Y. 11716

Filed Jul. 6, 1981, Ser. No. 280,941
Int. Cl.³ H01R *4/10, 43/04*
U.S. Cl. 339—97 C **10 Claims**



1. In an electrical connector, a one-piece continuous body bent lengthwise upon itself to form three overlying electrically connected surfaces at least two of which have a space therebetween to receive an elongated electrical conductor therein and between said two surfaces and the third of which has fastener means inseparably connecting the same in overlying relation to one of said two surfaces,

knife-shaped piercing means having a lengthwise dimension greater than its widthwise dimension on and extending lengthwise in the direction of one of said two surfaces for piercing through the electrical conductor in the direction of the elongation thereof to leave the width thereof substanially undisturbed to make positive electrical connection therewith and bendable into locking cooperation with another of said two surfaces to retain said two surfaces secured together in positive electrical contact with the electric conductor engaged therebetween when the space between said two surfaces is closed,

and tab means on said third surface to enable the completion of an electrical circuit with the electrical conductor through said body.

4,433,891
SUPPORT FOR CURRENT CARRYING MEMBER

George D. Gregory, Isla Verde, P.R. assignor to Challenger Caribbean Corporation, Canovanas; Challenger Products Corporation, Rio Piedras, both of, P.R. and Commander Electrical Equipment, Inc., Scarborough, Canada

Filed Mar. 11, 1982, Ser. No. 357,007
Int. Cl.³ H01C *3/08*
U.S. Cl. 339—217 R **7 Claims**

1. In combination,

a molded plastic housing having internal and peripheral portions set apart by a separation wall of said housing, said wall being provided with a horizontal slot therein, said

peripheral portion being provided with two opposing walls extending from said separation wall, one of said opposing walls being provided with a vertical groove from the top thereof to a horizontal plane, said horizontal plane being oriented just below the bottom of said horizontal slot, the other of said opposing walls being provided with a first vertical groove from the top thereof to said horizontal plane and with a second vertical groove from the bottom thereof to a location level with the bottom of said slot; and

a support for insertion into said grooves of said opposing walls including a metallic sheet having an oval hole therein, a single tab extending outward from said sheet along a first direction so as to be engageable with said vertical groove of said one opposing wall, and two additional spaced apart tabs extending outwardly from said sheet along a direction opposite to said first direction so as to be engageable with said vertical grooves of said other of said opposing walls.

4,433,892

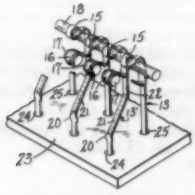
TERMINAL STRIP WITH AUXILIARY SUPPORT

Jack Seidler, Flushing, N.Y., assignor to North American Specialties Corp., Flushing, N.Y.

Filed Jan. 4, 1982, Ser. No. 336,970

Int. Cl.³ H01R 9/09

U.S. Cl. 339—258 P **2 Claims**



2. A strip of interconnected edge clips for attachment to contact pads on a circuit-bearing chip, comprising: a plurality of edge clips each having a free end and a stem end, the stem ends of the clips being connected with a carrier strip;

a pair of spaced spring fingers on the free end of each clip for receiving an edge of the circuit-bearing chip therebetween; and

an elongate auxiliary support strand extending past the free ends of the plurality of clips and being secured to the free end of each clip to provide auxiliary support for the clips; one of the spring fingers of each clip being crimped to the auxiliary support strand, and said one spring finger having a notch therein defining a fracture line, whereby the finger may be broken to release the support strand after the clip is attached to a circuit-bearing board.

4,433,893

PROCESS FOR PRODUCING HOLOGRAMS

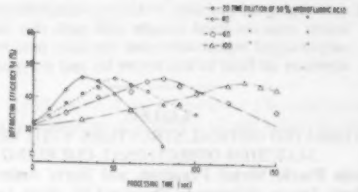
Masazi Yokota, and Masaru Noguchi, both of Saitama, Japan, assignors to Fuji Photo Film Co., Ltd., Asaka, Japan

Filed Jan. 12, 1982, Ser. No. 338,940

Claims priority, application Japan, Jan. 12, 1981, 56-2904

Int. Cl.³ G03H 1/22

U.S. Cl. 350—3.61 **2 Claims**



1. In a process for producing glass holograms having an uneven surface, the improvement wherein a surface of said glass holograms is subjected to a surface treatment with hydrofluoric acid.

4,433,894

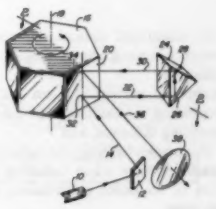
METHOD AND APPARATUS FOR GENERATING OPTICAL SCANS

Derald F. Hanson, and Randy J. Sherman, both of Phoenix, Ariz., assignors to Lincoln Laser Company, Phoenix, Ariz.

Filed Nov. 12, 1981, Ser. No. 320,331

Int. Cl.³ G02B 27/17

U.S. Cl. 350—6.8 **10 Claims**



1. A method for generating an optical output beam which repetitively scans a fixed straight path on a target by utilizing a rotating polygon mirror including a plurality of mirror facets, wherein the vertical angle of the mirror facets varies and defines a facet to axis error for each mirror facet, said method comprising the steps of:

a. directing an input beam of collimated light onto the facets of the rotating polygon mirror along a first path lying within a plane oriented perpendicular to the rotational axis of said mirror to produce a first scanned reflected output beam as each facet of said polygon mirror is rotated past the input light beam;

b. generating a second scanned reflected output beam by redirecting the first scanned reflected output beam through a prism and back onto said mirror facet along a second path, the second path being vertically displaced from the first path by a distance related to the facet to axis error, each point at which the second scanned reflected output beam intercepts said mirror facet being laterally offset from a corresponding point at which the input beam intercepts said mirror facet by a distance related to the facet to axis error wherein the hypotenuse facet of said prism is oriented parallel to the rotational axis of said mirror and wherein the roof edge of said prism lies within

a plane positioned between the first and second scanned reflected output beams and oriented perpendicular to the rotational axis of said mirror;

c. generating a third scanned reflected output beam by reflecting the second scanned reflected output beam from said mirror facet, wherein the plurality of third scanned reflected output beams generated by the sequentially rotated facets of said polygon mirror are scanned through parallel, non-coincident paths; and

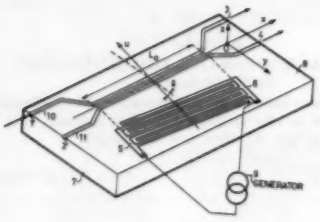
d. converging the plurality of third scanned reflected output beams onto the fixed straight path such that the optical output signal repetitively scans the fixed path to thereby eliminate all facet to axis errors for said polygon mirror.

4,433,895

INTEGRATED OPTICAL STRUCTURE WITH VELOCITY MATCHED DIRECTIONAL COUPLING

Claude Puech; Michel Papuchon, and Hervé Arditty, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Aug. 20, 1981, Ser. No. 294,557
Claims priority, application France, Aug. 29, 1980, 80 18772
Int. Cl.³ G02B 5/174
U.S. Cl. 350—96.13 **15 Claims**



1. An integrated optical structure with velocity matched directional coupling comprising:

a substrate,

two optical waveguides on the surface of said substrate providing an exchange of energy over a predetermined coupling distance, and

an electromechanical transducer emitting a progressive, elastic surface wave inducing the synchronous propagation of an index disturbance accompanying the guided photons,

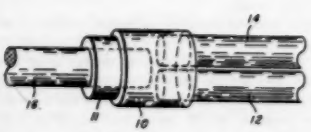
the obliquity of wavefronts reaching said waveguides being adjusted so that synchronous propagation is achieved between said guided photons and said index disturbance.

4,433,896

COAXIAL OPTICAL FIBER CONNECTOR

Gary A. Frazier, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 5, 1981, Ser. No. 308,346
Int. Cl.³ G02B 7/26
U.S. Cl. 350—96.21 **8 Claims**



1. A fiber optic coupler for coupling two mutually isolated fibers to a union fiber, comprising:

a female element generally shaped as a cylindrical shell, said female element comprising an inside diameter which is equal to twice the diameter of one of said mutually isolated fibers, plus clearance; and

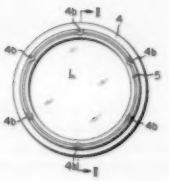
a male element shaped generally as a cylindrical shell, said male element having an inside diameter which is equal to the diameter of said union fiber plus clearance, and said male element having an outside diameter which is approximately equal to the inside diameter of said female element.

4,433,897

LENS SUPPORTING ASSEMBLY

Masaaki Kojima, Tokyo; Takayuki Suzuki, and Hiromichi Abe, both of Kawasaki, all of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Jul. 27, 1981, Ser. No. 287,106
Claims priority, application Japan, Aug. 8, 1980, 55/108205
Int. Cl.³ G02B 7/02
U.S. Cl. 350—252 **7 Claims**



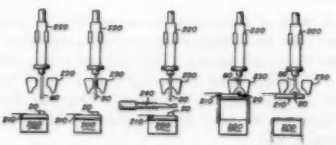
1. An optical lens supporting assembly comprising a support frame having a cylindrical containing section and an internally projecting flange at one end of the containing section, an optical lens fitting in the containing section and having one surface bearing against said flange, a lens keep ring member fitting in the containing section and having one end face bearing against the peripheral edge of the opposite surface of the lens for holding the lens between the flange and said one end face, and means providing an even number of calking projections bearing against the opposite end face of the ring member for holding the ring member against the lens, said even number of calking projections being circumferentially spaced around the containing section at mutually opposed positions and at equal angular intervals with respect to the optical center of the lens.

4,433,898

FIBER OPTIC ASSEMBLY FOR COUPLING AN OPTICAL FIBER AND A LIGHT SOURCE

Saeed Nasiri, San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Dec. 22, 1980, Ser. No. 219,076
Int. Cl.³ G02B 7/26
U.S. Cl. 350—96.17 **15 Claims**



1. A method for heat molding a plastic optical fiber to a light source having a light emitting surface and mounted to a base, the method comprising the steps of:

heating the light source;

heating one end of the plastic optical fiber;

aligning the heated one end of the plastic optical fiber with the heated light source;

abutting the heated one end of the plastic optical, fiber against the heated light source to encapsulate the light emitting surface of the light source in plastic optical fiber; and

cooling the plastic optical fiber and the light source.

4,433,899

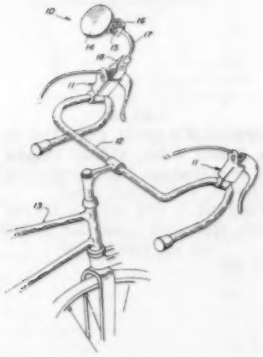
REAR VIEW MIRROR FOR DROP TYPE BICYCLE HANDLE BARS

Frederick Sellet, 546 94th St., Brooklyn, N.Y. 11209; Guerino F. George, 7803 14th Ave., Brooklyn, N.Y. 11228, and Thomas S. Abbondante, 1052 62nd St., Brooklyn, N.Y. 11219

Filed Sep. 28, 1981, Ser. No. 306,084

Int. Cl.³ G02B *7/18*

U.S. Cl. 350—307 **1 Claim**



1. In combination, a hand brake and a rear view mirror for drop type bicycle bars, the hand brake being supported from the hand bar in upstanding orientation and comprising a resilient rubber boot surrounding an internal brake mechanism, said rear view mirror comprising a mirror pivoted on a pin supported in a bracket affixed to an arcuately curved stem, an inverted U-shaped clip member depending from and supporting the lower end of the stem and having a pair of spaced apart parallel bifurcated legs insertable into said hand brake to straddle the brake mechanism and be securely retained between said boot and brake mechanism, said mirror being pivotable between a forward and rearward facing direction, whereby said rear view mirror can be utilized on right or left hand brakes.

4,433,900

PERMANENT DISPLAY LIQUID CRYSTAL DEVICE VIA VOLTAGE APPLICATION

Nobuyuki Sekimura, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

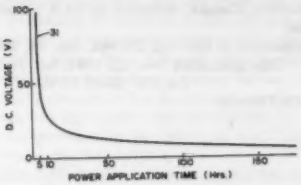
Filed Sep. 21, 1981, Ser. No. 304,312

Claims priority, application Japan, Sep. 25, 1980, 55-134109; Sep. 25, 1980, 55-134110; Sep. 26, 1980, 55-133736; Sep. 26, 1980, 55-133738; Sep. 26, 1980, 55-133739

Int. Cl.³ G02F *1/137, 1/133*

U.S. Cl. 350—331 R **39 Claims**

1. A liquid crystal display device having a layer of liquid crystals sandwiched between a pair of substrates of which at least one substrate is transparent, characterized in that the liquid crystal display device comprises a fixed display pattern formed by applying an effective voltage of at least about 3



volts D.C. or 10 volts A.C. for at least about 5 hours to provide a permanent orientation of said layer of said liquid crystals.

4,433,901

ALL SOLID TYPE ELECTROCHROMIC DISPLAY ELEMENT

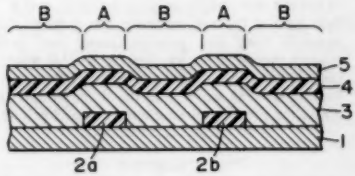
Yosuke Takahashi, Sagamihara; Hideki Akasaka, Yokohama; Toshikatsu Kasui, Tokyo; Tatsuo Niwa, and Tsuneo Sukegawa, both of Kawasaki, all of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Jun. 1, 1981, Ser. No. 268,683

Claims priority, application Japan, Jun. 19, 1980, 55-82109

Int. Cl.³ G02F *1/17*

U.S. Cl. 350—357 **4 Claims**



1. An all solid type electrochromic display element comprising a first electrode, a first oxidation-reduction reaction layer which is reversibly oxidation-reduction reactive, a transparent insulating layer which is a good proton conductor, a second oxidation-reduction reaction layer which is reversibly oxidation-reduction reactive and a second electrode, laminated in that order, wherein when one of said first and second oxidation-reduction reaction layers is oxidized, the other is reduced, said two layers being formed of an electrochromic material which is able to change in color when a voltage is applied thereto and wherein at least one of said first and second electrodes is transparent, and characterized in that p1 (a) the only patterned layer being one of said first and second oxidation-reduction reaction layers which is patterned in the form of a figure to be displayed;

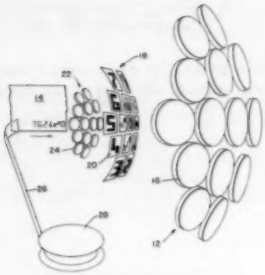
(b) a voltage level equal to or more than a minimum voltage required for causing the change in color at a portion corresponding to the figure to be displayed out of patterned reaction layer and non-patterned reaction layer, the voltage level being lower than a minimum voltage needed for causing the change in color of the whole of the patterned reaction layer and non-patterned reaction layer, is applied between said first and second electrodes.

4,433,902

PROJECTION PRINTER

Miroslav S. Osmera; Ralf M. Brooks, and Sung-Soon Kim, all of Waterloo, Canada, assignors to NCR Corporation, Dayton, Ohio

Continuation of Ser. No. 159,888, Jun. 16, 1980, abandoned. This application Nov. 12, 1981, Ser. No. 320,803
Int. Cl.³ B41B *13/00*
U.S. Cl. 354—10 2 Claims



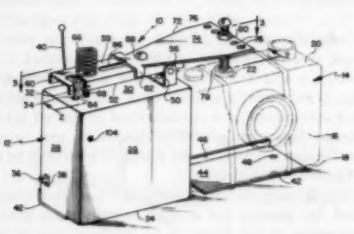
1. A projection printer comprising a
plurality of thermal energy light elements arranged in arcuate manner,
printing paper spaced from said plurality of light elements and movable along a line of printing, a
plurality of masks each associated with and disposed in like arcuate manner as each of said light elements and including an enlarged aperture representing a character to be printed, a
plurality of projection lenses each associated with and positioned in like arcuate manner as each of said light elements and each of said masks to receive images of characters and to reduce said images prior to printing, and a
ribbon having thermal sensitive ink material thereon and movable with said printing paper and positioned in contact therewith for transferring said ink material thereto upon pulsing of said light elements to act on said ribbon by heating said ink material in the shape of apertures in said masks for printing of characters on said printing paper.

4,433,903

REMOTE CONTROLLED CAMERA OPERATING DEVICE

Nader Afdasta, 30 Viking Dr., Bristol, R.I. 02809

Filed Sep. 15, 1982, Ser. No. 418,307
Int. Cl.³ G03B *17/38*
U.S. Cl. 354—266 8 Claims



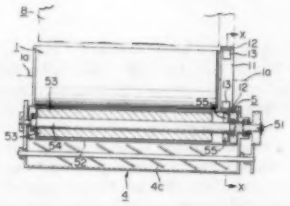
1. A device for the remote controlled actuation of a camera of the type having a depressible shutter button disposed on an outer surface thereof, said device comprising a housing, a bracket outwardly extending from said housing and on which the base of said camera is adapted to rest, means associated with said bracket for releasible positioning said camera thereon, a lever arm pivotally mounted on said housing and adapted to be driven at one end thereof by drive means mounted in said housing and operable upon a predetermined signal, a plate adjustably attached to said lever arm and adapted to extend outwardly over said bracket, said plate longitudinally slidable with respect to said lever arm, an actuation pin vertically adjustably mounted at the outer end of said plate, said pin further being adjustably movable back and forth along the width of said plate such that said actuation pin can be disposed in a variety of positions including one directly above the depressible shutter button of the camera supported by said bracket such that actuation of said drive means by said predetermined signal moves said plate outer end downwardly so that said pin contacts and depresses said button.

4,433,904

ELECTROPHOTOGRAPHIC COPYING MACHINE

Isao Ikemoto; Junichi Koiso; Akihiko Tamura, and Tsugio Hirabayashi, all of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Dec. 8, 1981, Ser. No. 328,749
Claims priority, application Japan, Dec. 20, 1980, 55-179692
Int. Cl.³ G03G *15/09*
U.S. Cl. 355—3 DD 12 Claims

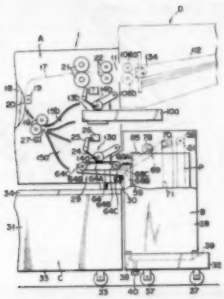


1. In an electrostatic image reproducing system including an image recording body having an image recording area thereon, a developing unit arranged adjacent to said image recording body to develop a latent image formed on said image recording body by developer containing a magnetic material, and a cleaning unit arranged adjacent to said image recording body to clean developer off of said image recording body, the improvement wherein one of said developing unit and said cleaning unit comprises:
a first magnetic brush unit including a first revolving element having a first revolving axis therein and having a plurality of magnets inside said first revolving element, said first revolving element being adjacent to said image recording body and confronting said image recording area of said image recording body; and
a second magnetic brush unit axially adjacent to said first magnetic brush unit for attracting and transferring developer, including a second revolving element having a second revolving axis therein which is substantially colinear with said first revolving axis, said second magnetic brush unit being arranged so as to be adjacent to but not confronting said image recording area of said image recording body.

4,433,905
SHEET AND ORIGINAL FEEDING FOR IMAGE FORMING SYSTEM

Toshio Haramaki, Yokohama, and Shigeru Nakayama, Kawasaki, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Mar. 23, 1982, Ser. No. 361,104
Claims priority, application Japan, Mar. 27, 1981, 56-45202
Int. Cl.³ G03G 15/00
U.S. Cl. 355—3 SH 12 Claims



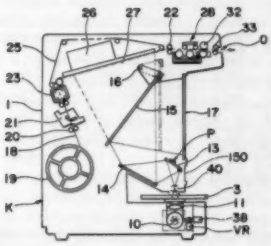
1. An image forming system comprising:
a platform placed on a floor;
an image forming device having a first body mounted on said paltform and an exposure unit provided on the upside of the first body for exposing an original placed thereon;
sheet feeding means provided at one side of the first body and including a cassette which receives a small number of copying papers of one size therein and is detachably attached to a middle part of said one side of the first body and a feeder placed on the floor which receives a large number of copying papers with another size therein and is detachably attached to a lower part of said one side of the first body;
sheet exhausting means provided at an upper part of said one side of the first body;
said image forming device for copying an image corresponding to the original on a copy sheet fed from said sheet feeding means and for exhausting the copied sheet from said sheet exhausting means; and
an original feeding device having a second body arranged on the exposure unit, an original inserting means provided at one side of the second body in the same side of the one side of the first body and inserted with the original thereto, an original exhausting means provided at said one side of the second body and exhausted with the copied original and a conveying mechanism for conveying the inserted original to the exposure unit and conveying the original exposed thereat to the original exhaust means.

4,433,906
MICROFILM READER PRINTER EQUIPPED WITH IMPROVED EXPOSURE AMOUNT CONTROL ARRANGEMENT

Keiji Nakatani, Kawasaki, and Shiro Toriumi, Zama, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Sep. 8, 1981, Ser. No. 300,284
Claims priority, application Japan, Sep. 26, 1980, 55-134838
Int. Cl.³ G03B 27/52
U.S. Cl. 355—55 14 Claims

1. A microfilm reader printer comprising:
a light source for illuminating images on a microfilm;
a projecting surface;
an optical system between said light source and said projecting surface including (a) at least one projecting lens for projecting images from the microfilm onto said projecting surface, (b) means for changing the projection magnification of the projected images without changing the distance between the microfilm and said projecting surface and being constituted by interchangeable lenses at a position along the optical axis of said optical system and which interchangeable lenses have different distances between the exit pupils thereof and the projecting surface, respectively, and (c) a condenser lens movable along the optical axis between said light source and said microfilm;
a photodetector provided in the light path from said light source to said projecting surface;
a control means connected between said photodetector and said light source for setting the quantity of light delivered onto the projecting surface at a value in accordance with the output of said photodetector by controlling the length of time of operation of said light source;

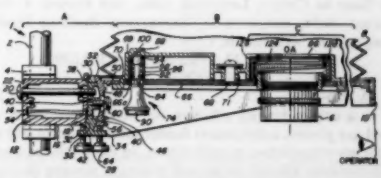


a position detecting means for detecting the position of said condenser lens which has been changed in accordance with the change-over of the projection magnification; and
compensating means operatively associated with said control means and said position detecting means for compensating for the change in the quantity of light delivered onto the projecting surface after the changeover of the projection magnification by changing said time of operation in accordance with the changed projection magnification by compensating the output of said photodetector in accordance with the position detected by said position detecting means so as to adjust the length of time of operation of said light source for setting the quantity of light delivered to said projecting surface at a predetermined value, whereby the quantity of light on the projecting surface is maintained at said predetermined constant value regardless of the changeover of the projection magnification.

4,433,907
LENS ALIGNMENT STRUCTURE

Giuseppe Tarsia, Valley Stream, N.Y., assignor to Berkey Photo, Inc., White Plains, N.Y.

Filed Feb. 18, 1982, Ser. No. 349,775
Int. Cl.³ G03B 27/52
U.S. Cl. 355—55 23 Claims



1. An adjustable lens mounting comprising:
a lens stage having a longitudinal axis extending from front to rear and a lateral axis extending from left to right, said

lens stage including pitch alignment means for selectively adjusting the rotation of said lens stage about said lateral axis and roll alignment means for selectively adjusting the rotation of said lens stage about said longitudinal axis; and

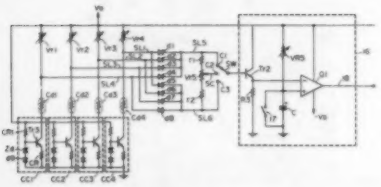
a lens mount means associated with said lens stage for positioning a lens element in the optical path.

4,433,908

DEVICE FOR SETTING EXPOSURE QUANTITY

Kokichi Omi, Kawasaki, and Yasuo Kuroda, Sagamihara, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 136,104, Mar. 31, 1980, abandoned. This application Nov. 12, 1981, Ser. No. 320,702
Claims priority, application Japan, Apr. 9, 1979, 54-43252
Int. Cl.³ G03B *27/80*
U.S. Cl. 355—68 **3 Claims**



1. An exposure quantity setting device comprising:

(a) detection means including a plurality of light detectors for receiving light from a plurality of divided portions in an object, and for forming a light signal corresponding to the intensity of the light received;

(b) first selection means for selecting the maximum light signal obtained from the light detector which has detected the maximum amount of light among said plurality of light detectors;

(c) second selection means for selecting the minimum light signal obtained from the light detector which has detected the minimum amount of light among said plurality of light detectors;

(d) third selection means including intermediate light signal forming means for forming an intermediate light signal between the maximum and minimum light signals, means for varying the intermediate signal level formed by said third selection means between the maximum and minimum light signal levels, and means for selecting among the maximum light signal obtained from said first selection means, the minimum light signal obtained from said second selection means, and the intermediate light signal obtained from said intermediate light signal forming means; and

(e) exposure quantity setting means for setting an exposure quantity by a light signal selected by said third selection means.

4,433,909

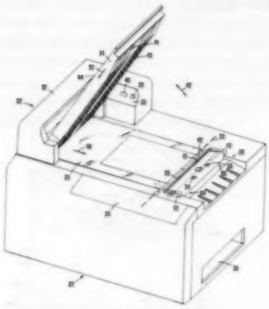
PIVOTING REFERENCE EDGE

Kate Goes In Center, Loveland, Colo., and Francis J. Schell, Tucson, Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 22, 1982, Ser. No. 360,309
Int. Cl.³ G03B *27/62*
U.S. Cl. 355—75 **20 Claims**

1. In a copier having a platen on which documents to be copied are placed, a document feeder for registering and moving documents relative to said platen, an exit path for conveying documents ejected from said platen, a sensing device responsive to the movement of a document in said exit path for producing an output signal, and controls responsive to said signals and selectively operable to cause said document feeder to function either in an enabled mode wherein said feeder automatically registers and moves documents or in a disabled mode wherein said feeder is prevented from positioning and moving documents, an improvement comprising:

a manual registration means movable between a first position displaced from said platen and a second position wherein a document reference zone is being established on the platen by the manual registration means;



a position sensing means including the sensing device disposed relative to the exit path and operable to produce output signals; and

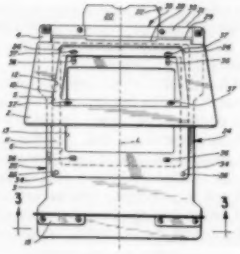
a control means including the controls responsive to the signals and operable to cause establishment of the disabled mode when the plate is in the second position.

4,433,910

TRANSPARENCY HOLDER

Giuseppe Tarsia, Valley Stream, N.Y., assignor to Berkey Photo, Inc., White Plains, N.Y.

Filed Feb. 18, 1982, Ser. No. 349,772
Int. Cl.³ G03B *27/62*
U.S. Cl. 355—76 **11 Claims**



1. A transparency holder comprising

carrier means of two opposing apertured plates, said apertures positioned for coaxial alignment with a light beam,

mask means of two opposing apertured plates adapted for releasably compressibly holding therebetween a transparency, said mask means adapted to be selectively interposed between said carrier means plates in predetermined locations by positioning means, said mask means apertures positioned for coaxial alignment with the light beam,

cassette means adapted to removably receive said carrier means and defining an aperture positioned for coaxial alignment with the light beam,

movable wedge means attached to and externally accessible of said cassette means for selectively releasing said compressive hold of said mask means on said transparency, whereby said transparency may be adjustably positioned

in said optical path without removing said carrier means from said cassette means.

4,433,911

METHOD OF EVALUATING MEASURE PRECISION OF PATTERNS AND PHOTOMASK THEREFOR

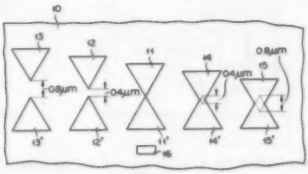
Shizuo Sawada; Mitsugi Ogura, and Norio Endo, all of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Jun. 23, 1982, Ser. No. 391,297

Claims priority, application Japan, Jun. 30, 1981, 56-101600

Int. Cl.³ G03B *27/28;* G01B *11/00*

U.S. Cl. 355—125 **15 Claims**



1. A method of evaluating the measure precision of a pattern formed in a substrate comprising:

(a) providing a photomask including a first measure precision evaluating pattern having a plurality of pairs of pattern elements, pattern elements of each pair being spaced a predetermined distance from each other and arranged opposite to each other, and a second measure precision evaluating pattern having a plurality of pairs of pattern elements, pattern elements of each pair being arranged opposite to each other and overlapped each other in a predetermined measure to form a constricted portion, said predetermined distance being varied with every pair of pattern elements and said predetermined measure of overlapped area between pattern elements being varied with every pair of pattern elements;

(b) transcribing said measure precision evaluating patterns to a substrate; and

(c) finding a pair of pattern elements formed in the substrate, which contact each other without overlapping to know the dimensional change from the distance or the measure of overlapped area between pattern elements in the photomask which correspond to said pair of pattern elements found.

4,433,912

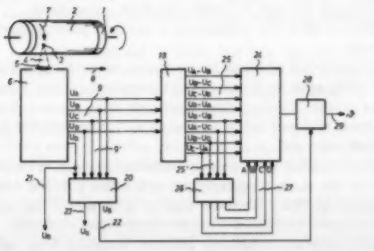
METHOD AND A CIRCUIT FOR DETERMINING A CONTOUR IN AN IMAGE

Robert Schwartz, Setauket, N.Y., assignor to Dr. Ing. Rudolf Hell GmbH, Kiel, Fed. Rep. of Germany

Filed Jan. 21, 1982, Ser. No. 341,525

Int. Cl.³ G05B *19/405*

U.S. Cl. 356—150 **12 Claims**



1. In a method of determining a contour-defining angle formed by a contour in an image within a relatively small region thereof with a predetermined direction, the contour being defined by the transition from a light area to a dark area within said region,

the steps comprising,

selecting said region so that said contour passes as closely as possible through a center thereof,

subdividing said region into a number of sectors of substantially equal areas distributed substantially symmetrically about said center, and separated from one another by respective separation lines, aid number being an even number and at least four, one of said separation lines coinciding with said predetermined direction,

obtaining brightness signals from each of said sectors in dependence of the proportion of the dark-to-light areas extending over each respective sector,

generating difference signals from respective oppositely disposed sectors, one of said difference signals being associated with said transition from said light area to said dark area having a value below a maximum value obtained from each of the remaining difference signals, save the difference signal associated with the transition from said dark area to said light area, thereby identifying the sector in which the transition from said light area to said dark area occurs, and

determining a first angle-defining quotient of the difference signal obtained, on one hand, from the so identified sector and the sector adjacent thereto as viewed along a prearranged angular direction, and, on the other hand, from one of said difference signals having said maximum value, whereby the contour-defining angle is obtained as the sum of said first angle and a second angle which is subtended between said predetermined direction and said one separation line, as viewed along said prearranged angular direction.

4,433,913

REFRACTIVE INDEX OF A LIQUID REFERRED TO A PREDETERMINED TEMPERATURE

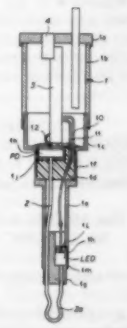
Alan L. Harmer, Plan les Ouattes, Switzerland, assignor to Battelle Memorial Institute, Switzerland

Filed Jan. 28, 1982, Ser. No. 343,698

Claims priority, application Switzerland, Jan. 30, 1981, 611/81

Int. Cl.³ G01N *21/43*

U.S. Cl. 356—133 **5 Claims**



1. A device for determining the index of refraction of a fluid reduced to a predetermined reference temperature, comprising:

a housing;

an optical fiber mounted on said housing and having a sensor portion projecting from said housing and formed with

alternating curvatures for introduction into a fluid whose index of refraction is to be measured;

a light-intensity detector connected to one end of said optical fiber for measuring the luminous intensity transmitted through said optical fiber; and

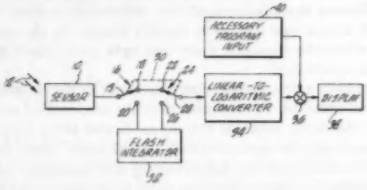
a light source in said housing positioned to lie in thermally conductive relationship with said fluid whereby said source is substantially at the same temperature as said fluid, said source having a temperature coefficient of luminous output such that its luminous output varies inversely with temperature according to a law which compensates the luminous output of said source for variation in the index of refraction of said fluid as a function of the temperature.

4,433,914

EXPOSURE METER

Kenneth J. Curran, Thousand Oaks, Calif., assignor to Vivitar Corporation, Santa Monica, Calif.

Filed Sep. 14, 1979, Ser. No. 75,709
Int. Cl.³ G01J *1/46*
U.S. Cl. 356—223 **18 Claims**



1. An exposure meter for measuring light from continuous or flashed light sources or both, comprising

sensor means for generating a signal proportional to the intensity of the light,

timing means for generating a predetermined time period signal corresponding to a predetermined time period,

integrator means responsive to the predetermined time period signal and to the sensor means signal for summing the signal from the sensor means for at least one predetermined time period and for providing a signal proportional to the sum,

logarithmic amplifier means responsive either to the integrator means signal or to the sensor means signal for producing a logarithmic signal that is logarithmically proportional to the signal applied thereto, and

display means responsive to the logarithmic signal for displaying exposure data related to light continuously falling upon the sensor means during exposure meter operation or light falling upon the sensor means during the at least one predetermined time period respectively.

4,433,915

DUAL-POLARIZATION INTERFEROMETER WITH A SINGLE-MODE WAVEGUIDE

Joel G. Hanse, Edina, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 15, 1981, Ser. No. 311,584
Int. Cl.³ G01C *19/64*
U.S. Cl. 356—350 **71 Claims**

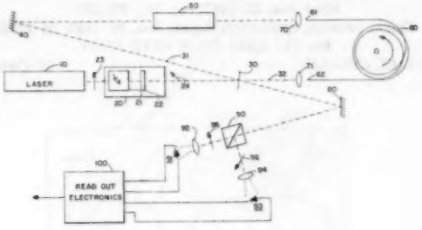
1. An angular rate sensor comprising:

waveguide means;

electromagnetic wave generating means capable of generating first and second electromagnetic waves having a common frequency and having first and second polarization states respectively, said electromagnetic wave generating means capable of directing

(a) a first component of each of said first and second electromagnetic waves through said waveguide means in a first direction so as to travel through said waveguide means only once, said first components emerging from said waveguide means phase-shifted by a value related to the rate of rotation of said waveguide means, and

(b) a second component of each of said first and second electromagnetic waves through said waveguide means in a second direction opposite to said first direction so as to travel through said waveguide means only once, said second components emerging from said waveguide means



phase-shifted by a value related to the rate of rotation of said waveguide means; and

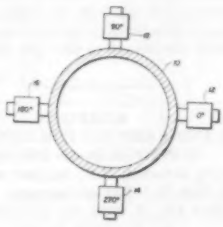
readout means, responsive, to said first and second components of each of said first and second electromagnetic waves emerging from said waveguide means phase-shifted by said rate of rotation of said waveguide means, for providing a signal indicative of the rate of rotation of said waveguide means.

4,433,916

ACOUSTIC RESONATOR HAVING TRANSDUCER PAIRS EXCITED WITH PHASE-DISPLACED ENERGY

Mark N. Hall, P.O. Box 162, College Place, Wash. 99324

Filed Nov. 2, 1982, Ser. No. 438,444
Int. Cl.³ B01F *11/02*
U.S. Cl. 366—114 **6 Claims**



1. An acoustic resonator apparatus for transmitting acoustic energy from a plurality of acoustic transducer means to a medium passing through a cylindrical shell, comprising:

a cylindrical shell for containing a medium passing therethrough;

a plurality of pairs of acoustic transducer means mounted on said shell, each said pair being comprised of two transducer means 180° displaced from each other on said shell, and each said pair being displaced 90° on said shell from another pair; and

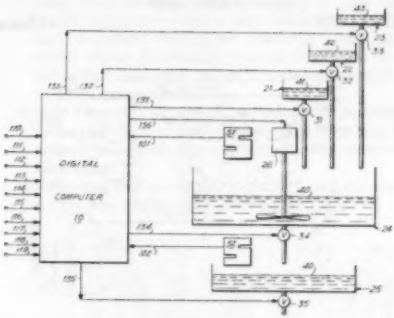
means for exciting each pair of transducer means with energy of the same frequency as each other pair but 180° displaced in phase from the energy with which the pair which is 90° displaced on said shell from such pair is excited, whereby relatively efficient coupling from said transducer means to said medium is effected.

4,433,917

RESIN CATALYZATION CONTROL SYSTEMS

Jack M. Mendel, Chester; Carl C. Bomgardner, Middletown, both of N.Y.; Robert W. Rack, Ramsey, N.J.; Donald G. Scott, Cornwall, and August W. Stritmater, Sloatsburg, both of N.Y., assignors to International Paper Company, New York, N.Y.

Filed Apr. 23, 1982, Ser. No. 371,357
Int. Cl.³ B01F 3/08, 15/02
U.S. Cl. 366—132 11 Claims



1. An apparatus for preparing a mixture in batches and supplying it to a feed station comprising:

a mixing tank;

means for transferring the mixture from the mixing tank to the feed station;

a first source for supplying a first ingredient of the mixture;

a second source for supplying a second ingredient of the mixture;

a first supply valve connecting the first source to the mixing tank;

a second supply valve connecting the second source to the mixing tank;

means for providing a mixing tank monitoring signal indicating the actual weight of the contents of the mixing tank;

means for providing a "start prep" signal to initiate the mixture preparation; and

logic control means responsive to the "start prep" signal and the mixing tank monitoring signal for opening and closing the first and second supply valves to sequentially add the first and second ingredients to the mixing tank in accordance with precalculated target weights, the control means including first calculator means responsive to the mixing tank monitoring signal for calculating a target weight for the second ingredient on the basis of the weight of the first ingredient actually added to the mixing tank.

4,433,918

ANALOG DISPLAY ELECTRONIC TIMEPIECE WITH MULTI-MODE DISPLAY CAPABILITY

Katsuo Nishimura, and Fukuo Sekiya, both of Tokorozawa, Japan, assignors to Citizen Watch Company Limited, Tokyo, Japan

Filed Jul. 7, 1981, Ser. No. 281,157
Claims priority, application Japan, Jul. 18, 1980, 55-98326; Oct. 9, 1980, 55-141464; Oct. 13, 1980, 55-141958
Int. Cl.³ G04B 23/02
U.S. Cl. 368—74 7 Claims

1. An analog display electronic timepiece provided with an alarm function and adapted to selectively indicate current time and a preset alarm time, comprising:

a standard frequency signal source for providing a standard frequency signal of relatively high frequency;

a frequency divider circuit responsive to said standard frequency signal for producing a first unit time signal having a period of one second and for producing a second unit time signal having a period which is an integral multiple of one second;

first drive circuit means responsive to said second unit time signal for producing a first drive signal;

a first electromagnetic transducer coupled to be driven by said first drive signal;

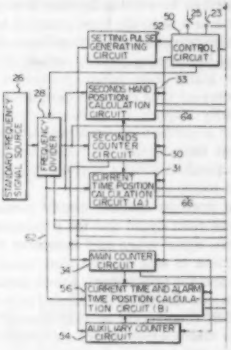
a first wheel train coupled to be driven by said first electromagnetic transducer;

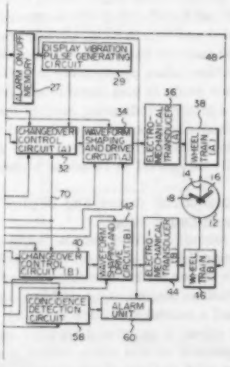
a minutes hand coupled to said first wheel train to be advanced a predetermined number of times per minute;

an hours hand coupled to said first wheel train to be rotated thereby;

second drive circuit means responsive to said first unit time signal for producing a second drive signal;

a second electromagnetic transducer coupled to be driven by said second drive signal;


SETTING PULSE GENERATING CIRCUIT
CONTROL CIRCUIT
SECOND HAND POSITION CALCULATION CIRCUIT
STANDARD FREQUENCY SIGNAL SOURCE
FREQUENCY DIVIDER
SECONDS COUNTER CIRCUIT
CURRENT TIME POSITION CALCULATION CIRCUIT (A)
MAIN COUNTER CIRCUIT
CURRENT TIME AND ALARM TIME POSITION CALCULATION CIRCUIT (B)
AUXILIARY COUNTER CIRCUIT



a second wheel train coupled to be driven by said second electromagnetic transducer;

a seconds hand coupled to said second wheel train to be rotated thereby;

externally operable switch means;

control circuit means responsive to actuation of said externally operable switch means for producing a plurality of control signals including alarm setting signals for selectively setting said timepiece in a current time mode and in an alarm time mode of operation;

calculation and counter circuit means for counting and memorizing said second unit time signal and said alarm setting signal, for thereby producing a first rapid advancement signal when said timepiece is changed over from operation in said current time mode to said alarm time mode, and for producing a second rapid advancement signal when said

timepiece is changed over from operation in said alarm time mode to said current time mode, and further for producing an alarm detection signal when the difference between said preset alarm time and current time becomes zero;

alarm means responsive to said alarm detection signal for producing an audible alarm signal;

changeover cotrol circuit means responsive to said control signal from said control circuit means for selectively transferring said second unit time signal to said first drive circuit means during said current time mode and for transferring said first rapid advancement signal to said first drive circuit means when changeover is performed from said current time mode to said alarm time mode, and further for transferring said second rapid advancement signal to said first drive circuit when changeover is performed from said alarm time mode to said current time mode; and

analog display means including a minutes hand and an hours hand coupled to be rotated by said first electromagnetic transducer and a seconds hand coupled to be rotated by said second electromagnetic transducer, said hours hand and minutes hand being thereby rapidly driven to indicate said preset alarm time when changeover is performed from said current time mode to said alarm time mode and being rapidly driven to indicate current time when changeover is performed from said alarm time mode to said current time mode, with said seconds hand being driven independently from said hours and minutes hands during said mode changeovers;

seconds hand position counter circuit means for counting said first unit time signal and for producing a third rapid advancement signal when said timepiece is changed over from operation in said current time mode to said alarm time mode and for producing a fourth rapid advancement signal when said timepiece is changed over from operation in said alarm time mode to said current time mode in response to said control signals from said control circuit means;

said second driver circuit means being further responsive to said third and fourth rapid advancement signals for producing third and fourth rapid advancement drive signals;

whereby said seconds hand is driven to a zero seconds indicating position when changeover is performed from said current time mode to said alarm time mode, and is rapidly driven to a position indicating current time seconds information when changeover is performed from said alarm time mode to said current time mode and is thereafter periodically advanced in response to said first unit time signal;

alarm memory circuit means and display vibration signal generating circuit means;

said alarm memory circuit means being responsive to a predetermined one of said control signals from said control circuit means for being selectively set to a first condition in which an alarm output enabling signal is generated thereby and a second condition in which an alarm output inhibiting signal is generated thereby, said alarm means being responsive to said alarm output enabling signal for generating said audible alarm signal when said coincidence detection is produced, and is inhibited from generating said audible alarm signal by said alarm output inhibiting signal;

said display vibration signal generating circuit means being responsive to said alarm output enabling signal for generating a display vibration signal, said changeover control circuit means being responsive to said control signals for transferring said display vibration signal to be input to said second drive circuit means during said alarm time mode to produce a drive signal therefrom, said second electromagnetic transducer being responsive to said drive signal for rotationally vibrating said second electromagnetic transducer about a fixed position, and said rotational vibration being transmitted by said second wheel train to said seconds hand whereby said seconds hand is rotationally vibrated about said zero seconds indicating position for thereby providing an indication that said timepiece is in said alarm time mode and in a state in which emission of said audible alarm signal is enabled.

4,433,919

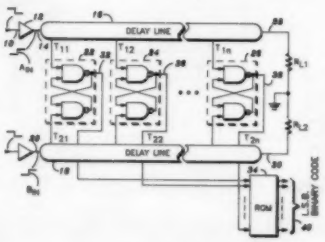
DIFFERENTIAL TIME INTERPOLATOR

David R. Hoppe, McHenry, Ill., assignor to Motorola Inc., Schaumburg, Ill.

Filed Sep. 7, 1982, Ser. No. 414,768

Int. Cl.³ G04F *8/00*

U.S. Cl. 368—120 **4 Claims**



1. A circuit for accurately determining a time between a first occurring and a second occurring signal event comprising:

first means for delaying the first occurring signal event, said first means having an input tap adapted for receiving the first occurring event signal, said first means having a successive series of n output taps, each of said first means of n output taps having a predetermined first time delay with respect to each preceding tap of said first means;

second means for delaying the second occurring signal event, said second means having an input tap adapted for receiving the second occurring event signal, said second means having a successive series of n output taps corresponding to said series of n output taps of said first means, each of said second means series of n output taps having a predetermined second time delay with respect to each preceding tap of said second means, said second predetermined time delay being shorter than said first predetermined time delay;

n means for sensing, each of said n means for sensing having a set, a reset and an output terminal, said set and reset terminals of each of said n sensing means being connected to said corresponding output taps of different ones of said series of n output taps of said first means and said second means, respectively; and

means for converting a one and a zero set in any specific pair of adjacent ones of said n means for sensing to a unique output signal responsive to said specific pair.

4,433,920

ELECTRONIC TIMEPIECE HAVING IMPROVED PRIMARY FREQUENCY DIVIDER RESPONSE CHARACTERISTICS

Fukuo Sekiya; Shigeru Morokawa, and Ryoji Iwakura, all of Tokorozawa, Japan, assignors to Citizen Watch Company Limited, Tokyo, Japan

Filed Jul. 7, 1981, Ser. No. 281,251

Claims priority, application Japan, Jul. 8, 1980, 55-92861; Jul. 15, 1980, 55-96429; Jul. 18, 1980, 55-98325; Jul. 21, 1980, 55-99567

Int. Cl.³ G04B *17/12*

U.S. Cl. 368—201 **5 Claims**

1. An electronic timepiece powered by a battery, comprising:

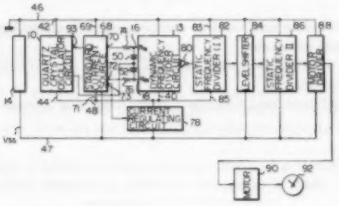
a standard frequency signal source for producing a standard

frequency signal, said standard frequency signal source being provided with a high potential power supply lead and a low potential power supply lead;

first frequency divider circuit means for performing frequency division of said standard frequency signal source to produce an output signal, said first frequency divider circuit means being provided with a high potential power supply lead and a low potential power supply lead and comprising a group of P-channel field-effect transistors each having a gate electrode thereof coupled to receive said strandard frequency signal and a group of N-channel field-effect transistors each having a gate electrode thereof coupled to receive said standard frequency signal, said N-channel field-effect transistor group gate electrodes being electrically isolated from said P-channel field-effect transistor group gate electrodes with respect to direct current flow;

second frequency divider circuit means for performing frequency division of said output signal from said first frequency divider circuit means to thereby produce a unit time signal;

drive circuit means coupled to receive said unit time signal for thereby producing a drive signal;



time display means responsive to said drive signal for indicating time information; and

bias circuit means comprising a standard current source for producing first and second bias voltages, said bias circuit means being provided with a high potential power supply lead which is connected in common with said high potential power supply lead of the first frequency divider circuit means, and a low potential power supply lead which is connected in common with said low potential power supply lead of the first frequency divider circuit means, said first bias voltage being applied to the gate electrodes of said P-channel field-effect transistor group to control an operating condition thereof and said second bias voltage being applied to the gate electrodes of said N-channel field-effect transistor group to control an operating condition thereof, said standard current source comprising at least one P-channel field-effect transistor and at least one N-channel field-effect transistor connected in series between said high potential power supply lead and low potential power supply lead of said first frequency divider circuit means.

4,433,921

WATCH CRYSTAL BONDED TO WATCH CASE WITH LOW TEMPERATURE SOLDER MATERIAL

Paul Gogniat, and Eric Loth, both of Bienne, Switzerland, assignors to Montres Rado S.A., Longeau, Switzerland

Filed May 18, 1982, Ser. No. 379,516

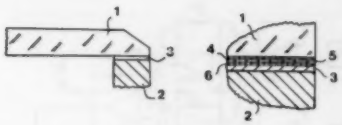
Claims priority, application Switzerland, May 22, 1981, 3355/81

Int. Cl.³ G04B *37/00, 39/00*

U.S. Cl. 368—294 **17 Claims**

1. A watchcase comprising a first part made of a transparent material being visible from outside of the case and a second part rigidly attached to the first, a layer of low-tmperature metal soldering material attaching said first and second parts formed between said first and second parts, characterized in that the first part of the case comprises a metal coating applied to that portion of its surface which meets the metal soldering layer, the said metal coating comprising at least three superimposed layers comprising

a first layer located next to the said surface of said first part serving to bond said metal coating thereto and mask the area being soldered,



a second layer superimposed on the first layer to restrain diffusion of said soldering material towards the first part and,

a third layer located next to the said metallic soldering layer to give the latter a purchase on the coating.

4,433,922

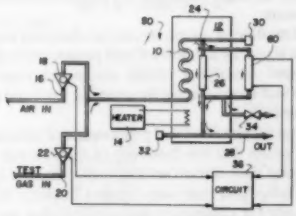
CALORIMETER

Thomas L. Bohl, Madison; Pocock, Robert E., Highland Heights, and Sharon L. Zimmerlin, Chagrin Falls, all of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Jul. 2, 1982, Ser. No. 394,955

Int. Cl.³ G01N *25/22*

U.S. Cl. 374—36 **5 Claims**



5. A method of continuously monitoring the calorific value of a gas comprising:

supplying the test gas at a constant known flow rate to a catalytic combustion chamber;

supplying an oxygen containing gas to the catalytic burning chamber at a known constant flow rate;

heating the catalytic burning chamber to completely burn the test gas to consume an amount of oxygen and produce a combustion product with remaining oxygen therein;

measuring the amount of remaining oxygen in a combustion product; and

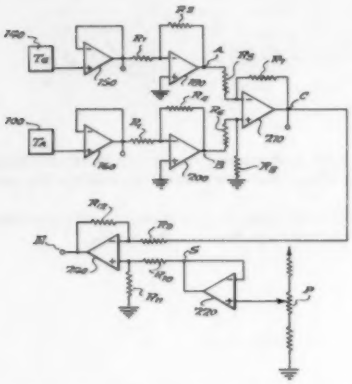
determining the catalytic value of the test gas which is proportional to the amount of oxygen consumed in the catalytic burning chamber which amount of oxygen consumed is proportional to the difference between the known volumetric flow of oxygen into the chamber and the amount of residual oxygen in the combustion product.

4,433,923

OPERATIVE TEMPERATURE SENSING SYSTEM

Richard J. Rascati, Guilford, and Larry G. Berglund, Branford, both of Conn., assignors to Morris L. Markel, North Tonawanda, N.Y.

Filed Aug. 3, 1981, Ser. No. 289,268
Int. Cl.³ G01K *3/14, 13/00*
U.S. Cl. 374—112 **12 Claims**



1. An operative temperature sensing system wherein operative temperature is the uniform temperature of a radiantly black enclosure in which an occupant would exchange the same amount of heat by radiation plus convection as in the actual nonuniform environment, the system comprising:

first temperature sensing means for generating a first signal having a value that is a function of the air temperature within an enclosed space;

a chamber;

second temperature sensing means including said chamber located within said enclosed space, for generating a second signal having a value that is a function of mean radiant temperature;

first signal modifying circuit means for changing the value of said first signal by a first fixed and predetermined amount;

second signal modifying circuit means for changing the value of said second signal by a second fixed and predetermined amount;

said first and second fixed and predetermined amounts representing values that are functions of the size and shape of said second temperature sensing means and are so related to each other that their sum is equal to unity; and

circuit means for combining the modified first and second signals to develop an output signal having a value that is a function of operative temperature within the enclosed space.

4,433,924

THERMAL REFERENCE APPARATUS

Thomas G. Quinn, III, Pepperell, Mass., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Sep. 18, 1981, Ser. No. 303,433
Int. Cl.³ G01J *5/20*
U.S. Cl. 374—2 **13 Claims**

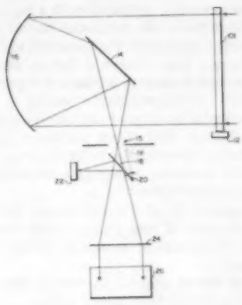
1. Thermal reference apparatus comprising:

A. a housing having a first end and second end;

B. an infrared window mounted in said first end of said housing;

C. thermoelectric temperature control means mounted in proximity with said second end of said housing;

D. a substrate in contiguous relationship with said control means, said substrate facing said window;



E. wherein said control means is used to either heat or cool said substrate;

F. wherein said substrate includes a temperature sensing means; and

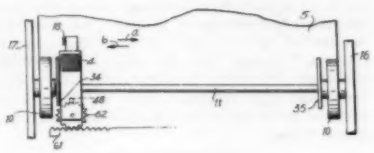
G. wherein said window is made from zinc selenide material.

4,433,925

MANUALLY-OPERATED DOT PRINTER FOR POCKET SIZED CALCULATORS

Hitoshi Fujiwara, and Masanao Matsuzawa, both of Shiojiri, Japan, assignors to Epson Corporation, Nagano and Kabushiki Kaisha Suwa Seikosha, Tokyo, both of, Japan

Filed Nov. 10, 1981, Ser. No. 320,046
Int. Cl.³ B41J *3/36*
U.S. Cl. 400—88 **4 Claims**



1. A printer for printing on a recording paper, comprising:

feed means for advancing said paper, said feed means including at least two separate feed rollers mounted on a feed shaft;

printing head means, said head means being mounted on said feed shaft for translation relative to said paper for printing a line of characters thereon, said printing head means being movable between said separate feed rollers;

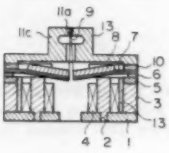
means for translating said printing head means for said printing;

printing means mounted on said printing head means and moving therewith, said printing means being subjected to actuation for printing on said paper when said printing head means is moved relative to said paper.

4,433,926
PRINTER HEAD

Minoru Isobe; Hiroshi Kikuchi; Minoru Teshima, all of Tokyo; Tadasi Kodama, Sakura, and Mitsuo Iwama, Yokosuka, all of Japan, assignors to Oki Electric Industry Co., Ltd. and Nippon Telegraph & Telephone Public Corporation, both of Tokyo, Japan

Continuation of Ser. No. 179,834, Aug. 20, 1980, abandoned. This application Aug. 2, 1982, Ser. No. 404,035
Claims priority, application Japan, Sep. 3, 1979, 54-111700
Int. Cl.³ B41J 3/12
U.S. Cl. 400—124 3 Claims



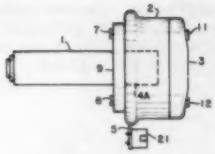
1. A printer head comprising:
a cylindrical permanent magnet;
a first yoke covering the bottom of said magnet;
n number of electromagnets, each having a center core and a coil wound around the core, positioned in a circle on said first yoke with predetermined angle intervals therebetween;
a disc-shaped spring having an outer ring and n number of projections projecting towards the center of said outer ring;
n number of elongated armatures, each positioned on one of the projections of said disc spring;
n number of print needles, each fixed to one of said armatures perpendicular to the plane of the disc spring wherein each of said needles is straight;
a ring-shaped spacer positioned between said disc spring and said cylindrical permanent magnet;
a second circular yoke fixed on said disc spring for providing a magnetic flux path between the permanent magnet and each of said electromagnets, said second circular yoke having radial slits for receiving said armatures;
a guideframe including a first portion having a thin linear slit for receiving the tops of said print needles wherein said guideframe covers the print needles;
said guideframe having a side hole means in a side wall of the first portion of the guideframe for receiving a tool for aligning the print needles, said tool having a pair of parallel linear arms with projections at the extreme ends thereof such that the arms contact each other at the projections with a spring action, and hold said print needles in a straight line between the parallel arms thereof; and
a cylindical oil felt means attached on the inner cylindrical surface of said permanent magnet coaxial therewith for providing lubrication between the spring and the core.

4,433,927
ELECTROMAGNET ASSEMBLY FOR MOSAIC PRINTING HEAD AND RELATED MANUFACTURING METHOD

Pier G. Cavallari, Novara, Italy, assignor to Honeywell Information Systems Italia, Caluso, Italy

Filed Feb. 19, 1982, Ser. No. 350,539
Claims priority, application Italy, Feb. 25, 1981, 19958 A/81
Int. Cl.³ B41J 3/12
U.S. Cl. 400—124 3 Claims

1. An electromagnet assembly for mosaic printing head comprising:
(a) a plurality of separate electromagnets, each one formed by a separate individual core and at least a winding coupled to said core, said winding being supported by a reel provided with electrical connecting pins;
(b) a printed circuit board to which said plurality of electromagnets is fixed by soldering of said pins to said printed circuit board, with exclusion of any other means fixing together said electromagnets;
(c) connection means through which said printed circuit

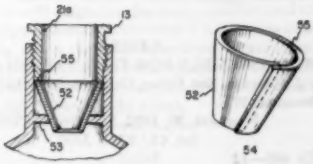


board may be connected to an external electric circuit; and
(d) insulating plastic means (enclosing) steadily encapsulating as an insert said printed circuit board and said plurality of electromagnets, except said connection means, in a unitary block, said plastic means and said printed circuit board being in lieu of any other mechanical support of said plurality of electromagnets.

4,433,928
ADJUSTABLE COSMETIC WIPER

Ted I. Kingsford, Memphis, Tenn., assignor to Plough, Inc., Memphis, Tenn.

Division of Ser. No. 96,710, Nov. 21, 1979, Pat. No. 4,332,494, which is a continuation-in-part of Ser. No. 857,074, Dec. 5, 1977, Pat. No. 4,194,848. This application May 26, 1982, Ser. No. 382,272
Claims priority, application European Pat. Off., Nov. 30, 1978, 78200323
Int. Cl.³ A46B 17/08
U.S. Cl. 401—122 10 Claims

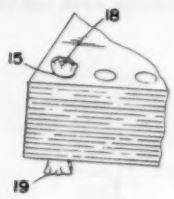


1. A package comprising:
a. a container having a fluent material therein;
b. a container closure;
c. a wiper having an orifice means adapted to wipe excess fluent material from the applicator, said wiper comprising a truncated cone having a single slit forming portions which overlap each other along the longitudinal axis of said container;
d. means for attaching the cone to permit adjustment of the degree of overlap;
e. an applicator attached to said closure and adapted to be passed through said wiper orifice and immersed in said fluent material when said closure is attached to said container;
f. a calibrated adjusting means to vary the cross sectional area of said orifice.

4,433,929
RECYCLABLE PAPER BINDING MEANS

Peter D. Jones, Canabury Square Apts. No. 365 Demont Ave., St. Paul, Minn. 55117

Filed Jul. 2, 1981, Ser. No. 279,786
Int. Cl.³ B42F 3/00
U.S. Cl. 402—14 8 Claims



1. An apparatus for securing together the sheets of a stack of recyclable paper material having openings located therein comprising:

a fastener member rolled into a rigid cylindrical member having a shank with sufficient length to extend through an opening in a stack of sheets of recyclable paper material;

retaining means including a collar located on each end of said fastening member to prevent the sheets of the stack of recyclable paper material from slipping off said fastening member; and

said fastening member constructed of a recyclable paper material so that when said sheets of recyclable paper material are recycled said fastening member can be recycled in the same process without forming harmful residue that may damage the recycling apparatus or the recycled products.

7. The method of securing together a stack of papers having a set of openings with a fastener member therein for recyclable use and then after use recycling the stack of papers and the fastener member comprising the steps of:

a. inserting a fastening member of recyclable paper material through the openings in a stack of papers;

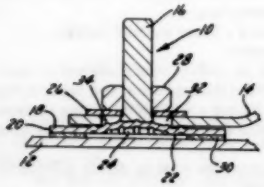
b. forming a head on the fastening member of recyclable paper material to prevent the stack of papers from slipping off the fastening member of recyclable paper material; and

c. after use of the recyclable stack of papers simultaneously recycling the stack of papers with the fastening member of recyclable paper material located therein.

4,433,930
STUD ASSEMBLY FOR THIN WALLED PANELS

Frank J. Cosenza, San Pedro, Calif., assignor to Rexnord Inc., Milwaukee, Wis.

Filed Jul. 30, 1982, Ser. No. 403,833
Int. Cl.³ F16B 5/00
U.S. Cl. 403—12 3 Claims



1. A stud assembly for securing a nonstructural panel to an attachment device comprising:

a base member having an upper and a lower surface;

a threaded shank fixedly attached perpendicular to said upper surface of said base member, said threaded shank insertable through an aperture in the attachment device,

an adhesive means disposed around the outer perimeter of said base member on said lower surface of said base member while leaving the central portion free of adhesive for holding and securing the stud assembly to the nonstructural panel, and

a nut means rotatable along said threaded shank to cause movement of said shank in an axial direction away from the nonstructural panel when said nut is tightened whereby said base member central portion is resiliently deformed without deforming the nonstructural panel.

4,433,931
ADAPTER DEVICE FOR BROOMS OR THE LIKE

Terrance J. Malish, 2520 Red Fox Pass, Willoughby Hills, and Lawrence A. Somrack, 2397 Somrack Dr., Willoughby, both of Ohio 44094

Filed Dec. 31, 1980, Ser. No. 219,301
Int. Cl.³ F16B 9/00; F16L 41/00
U.S. Cl. 403—194 19 Claims

1. A coupler device of the type for detachably mounting the working end element, such as a broom, brush, mop or the like, to a hollow handle of the type having a passageway therein, said coupling device comprising, an elongated circularly cylindrical body member, said body member being made from a polymeric material including a sleeve portion and a unitary nose portion, said nose portion being adapted for detachable securement within a corresponding socket portion provided in said working end element, a hollow circularly cylindrical sleeve portion made unitary with and extending outwardly away from said nose portion, said sleeve portion having an open end adapted to receive a free end of said handle, said sleeve portion defining a generally circularly cylindrical interior cavity having a unitary interior shoulder portion which extends laterally outwardly from said cavity and adapted for abutting coacting engagement with the end of said handle, said sleeve portion having a reduced diameter section and an enlarged diameter section defining said shoulder portion, said reduced diameter section being unitarily attached to said nose portion with said sections being disposed in generally concentric alignment with said nose portion, an upstanding post portion made unitary with and extending axially upwardly from said nose portion and adpated to be received in the passageway in said handle, said post portion having an axial bore extending therethrough, said post portion having a diameter and length sufficient to be received in frictional gripping engagement within the passageway in said handle, and with said post portion extending upwardly above the juncture of said nose and sleeve portions and terminating inwardly of the open end of said sleeve portion for holding said handle in secured and supported relation on said shoulder portion.

4,433,932
ROLLER BEARINGS INSTALLED WITHOUT CLEARANCE AND PRELOADED

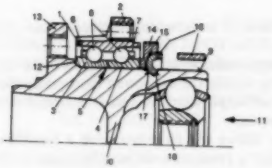
Manfred Brandenstein, Eussenheim; Rüiger Hans, Niederwerrn; Peter Horling, Mainberg; Hermann Hetterich, Heidenfeld; Gebhard Pape, Schweinfurt, and Willi Gössmann, Niederwerrn, all of Fed. Rep. of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Aug. 10, 1982, Ser. No. 406,907

Claims priority, application Fed. Rep. of Germany, Aug. 17, 1981, 3132442

Int. Cl.³ B25G *3/00*; F16B *9/00*; F16L *41/00*

U.S. Cl. 403—261 **4 Claims**



1. A fastening means securing an annular first machine element against axial displacement on an annular second machine element, said second machine element having a shoulder against which the first machine element abuts and an annular groove spaced from said shoulder comprising a first ring member circumscribing the second machine element and having one axial end face confronting and abutting an axial end face of said first machine element and defines an annular pocket, a second one-piece ring made of a deformable material which is initially sleeve-shaped and engages in the annular pocket is deformed in a radial direction as a result of axially applied pressure during assembly into the annular pocket in such a way that a portion thereof engages in the annular groove in the second machine element and secures the two in place.

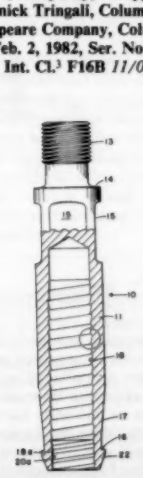
4,433,933
CONNECTOR FOR FIBER REINFORCED PLASTIC TENSION RODS

James H. Parsons, Jr., Prosperity; Philippe Hardy-The McLain, Gilbert, and Dominick Tringali, Columbia, all of S.C., assignors to The Shakespeare Company, Columbia, S.C.

Filed Feb. 2, 1982, Ser. No. 345,058

Int. Cl.³ F16B *11/00*

U.S. Cl. 403—268 **9 Claims**



1. A metal connector for the end portion of an FRP rod subjected to longitudinal tension, comprising a tubular body for encasing the rod and having a threaded end portion adapted to be coupled to a like connector, said body having a continuous wedge-shaped internal helical groove having a surface inclined radially at an angle toward the longitudinal axis of the body, the inner edge of said groove adapted to conform to the outer surface of said rod, and said groove adapted to be filled with bonding material that bonds to the rod but does not adhere to said groove.

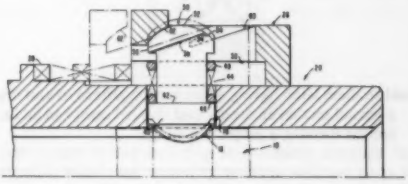
4,433,934
PUSH-PULL YOKE-POWER TAKEOFF COUPLING

Donald C. Cleveland, Rochester, Mich., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Aug. 19, 1982, Ser. No. 409,490

Int. Cl.³ F16B *7/00*

U.S. Cl. 403—318 **5 Claims**



1. A shaft coupling locking apparatus comprising a first shaft having longitudinal power transmission features and having a first end with a beveled edge and having a detent receiving means spaced axially from the first end, a shaft sleeve having an axial opening for receiving the shaft, the shaft sleeve having complementary longitudinal power transmission features for cooperating with power transmission features of the shaft to prevent relative rotation and to provide rotary power transmission between the shaft and the sleeve, the sleeve having an opening extending therethrough and having a pin slideable in the opening, collar means positioned on the sleeve and slideably axially thereon, the collar means having clamping means for holding the pin inward in the sleeve in contact with the detent receiving means in the shaft for locking the shaft in the sleeve, and the collar having moving means cooperating with the pin for moving the pin outward with respect to the sleeve for disengaging the pin from the detent receiving means in the shaft, said pin has an outer head with first ramp means and wherein the moving means comprises second ramp means in the collar for cooperating with the first ramp means to move the pin outward with respect to the sleeve, said first and second ramp means slope upward and outward in a direction of an end of the sleeve in which the shaft is received, whereby moving the collar away from that end of the sleeve moves the second ramp means axially, thereby moving the first ramp means in the pin outward with respect to the sleeve.

4,433,935
SIGN BRACKET

Keith A. Main, Howell, and David U. Hillstrom, Novi, both of Mich., assignors to Marketing Displays, Inc., Farmington Hills, Mich.

Filed Jun. 17, 1981, Ser. No. 274,400

Int. Cl.³ B25G *3/36*

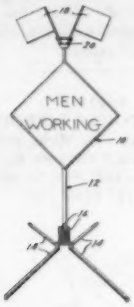
U.S. Cl. 403—385 **3 Claims**

1. A bracket for mounting a sign on a stand, said sign having at least one cross member, said bracket comprising;

a mounting portion for mounting said bracket on said stand, said mounting portion having locking means for locking said bracket onto said stand, and

a sign holding member affixed to said mounting member, said sign holding member forming a horizontal rigid channel having an open end, said sign holding member further having a resilient latch which normally encloses said channel open end and which may be moved away from said open end

thereby permitting said sign cross member to be removed and replaced within said channel



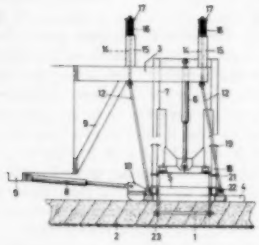
said resilient latch having a first section affixed to said bracket, a second section enclosing said channel open end and a third section forming a projecting flange.

4,433,936

DEVICE FOR DRIVING AND POSITIONING TOWELS INTO CONCRETE SLABS

Andreas Moser, 21, Vrijheidstraat, 2000 Antwerp, Belgium

Filed Oct. 21, 1981, Ser. No. 313,402
Claims priority, application Belgium, Nov. 7, 1980, 202732
Int. Cl.³ E01C *23/04*
U.S. Cl. 404—88 10 Claims



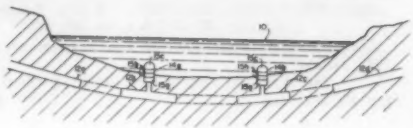
1. A device for driving and positioning, by vibration, dowels (1) into concrete slabs (2), during the construction of roads, on both sides of joints between said slabs and perpendicularly to said joints, comprising a horizontal beam (5) which is provided with vibrators and with maintaining elements (18) suitable for gripping the dowels and which is carried in guides (7) of an independent frame, so as to be vertically movable by displacement means above a joint, in order to drive said dowels into a lower position in the still unhardened concrete of the slabs, said device comprising also a lower smoothing plate (4) intended to bear and slide onto the surface of the already compacted concrete slabs (2), said lower plate having openings (26) for the passage of the dowels (1) and pressing guides (23) fixed to the horizontal beam (5) during the lowering of said horizontal beam (5), said elements (18) for maintaining the dowels (1) being connected to the horizontal beam (5) and to the pressing guides (23) so as to allow the horizontal beam and the pressing guides to move downwardly with respect to the maintaining elements (18) bearing on the lower plate (4), so as to cause the dowels (1) to be driven into the still unhardened concrete of the slabs (2).

4,433,937

METHOD OF TUNNEL CONSTRUCTION EMPLOYING SUBMERGED CAISSON

J. Vincent Harrington, 19 Dolphin Rd., Groton, Conn. 06340

Filed Mar. 23, 1982, Ser. No. 361,113
Int. Cl.³ E01G *4/04*
U.S. Cl. 405—137 14 Claims



1. A method of underwater excavation comprising the steps of:

A. providing a caisson at the floor of a body of water;

B. providing within the caisson at the bottom thereof an open-bottom bell-type work chamber adapted for retention of gases therein;

C. partially filling the chamber with a breathable mixture of gases under a pressure substantially equal to the static water pressure at the depth of the work chamber;

D. providing access from above into the work chamber;

E. excavating vertically into the body floor to form a recess below the caisson while supporting the caisson above the recess floor;

F. lowering the caisson into the recess; and

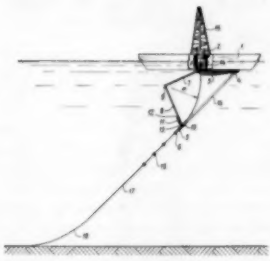
G. continuing the excavating and lowering steps until the caisson is at the desired depth to commence tunnelling generally horizontally.

4,433,938

METHOD AND APPARATUS FOR LOWERING AND POSITIONING A PIPE LINE ONTO THE BOTTOM OF A DEEP WATER

Bart Boon, Schiedam, Netherlands, assignor to Gusto Engineering B.V., Schiedam, Netherlands

Filed Dec. 14, 1981, Ser. No. 330,513
Claims priority, application Netherlands, Dec. 16, 1980, 8006816
Int. Cl.³ F16L *1/04*
U.S. Cl. 405—166 7 Claims



1. In a method for lowering and positioning a pipe line onto the bottom of deep water, comprising assembling pipe line from pipe sections upon a floating ship, said pipe line after reaching the bottom extending upwardly from the bottom along a curved path to an upwardly inclined rectilinear part that extends toward the ship; the improvement comprising exerting tension from said ship directly on a point of the rectilinear part of the pipe line from underneath said ship above the lower curved part, whereby the pipe line part above said point is bent as a result of a bending moment exerted thereon, and directing the last-named part such that the pipe line extends vertically into the ship.

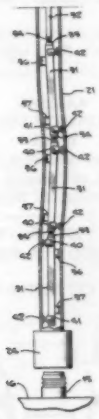
3. In apparatus for lowering and positioning a pipe line onto the bottom of deep water, comprising a floating ship carrying a supply of pipe sections to be connected to the already-assembled pipe line, the pipe line after reaching the bottom extending upwardly from the bottom along a curved path to an upwardly inclined rectilinear part that extends toward the ship; the improvement comprising means for exerting tension from said ship directly on a point of the rectilinear part of the pipe line far underneath said ship above the lower curved part, whereby the pipe line above said point is bent as a result of a bending moment exerted thereon, and means for directing the last-named part such that the pipe line extends vertically into the ship.

4,433,939

MARINE CONDUCTOR BENDING TOOL AND METHOD

Albert M. Regan, Huntington Beach, Calif., assignor to Hughes Tool Company, Houston, Tex.

Filed Aug. 31, 1981, Ser. No. 297,533
Int. Cl.³ E21B 7/12
U.S. Cl. 405—195 **13 Claims**



1. A method of aligning a marine conduit coupling to a subsea wellhead at the wellhead after the connector is run on the end of the marine conduit to adjacent the subsea wellhead from an overhead platform comprising the steps of:

bending a permanent bend in the lowermost portions of the marine conduit in a determinable manner to align the coupling to the wellhead it is adjacent; and

landing the marine conduit on said wellhead by lowering said conduit while said lowermost portions are bent in said determinable manner.

4,433,940

TETHERED SUBMARINE PRESSURE TRANSFER STORAGE FACILITY FOR LIQUIFIED ENERGY GASES

David B. Harrison, San Mateo, Calif., assignor to Cook Stolowitz & Frame, Visalia, Calif.

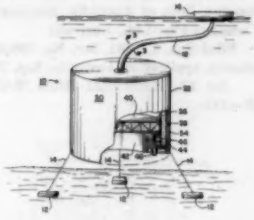
Filed Nov. 16, 1981, Ser. No. 321,385
Int. Cl.³ E02D 27/38
U.S. Cl. 405—210 **8 Claims**

1. An improved offshore submarine storage facility in the ocean and like water bodies for storing liquified energy gases and similar liquid materials under pressure and at cryogenic temperatures, said facility comprising:

two-part insulated submarine storage tank means positionable at selected depth in the water for storing said materials, wherein the two parts thereof move in a slidably sealing engagement relative to each other to form an insulated compression storage chamber,

said tank means including ambient water pressure transfer means for transferring external ambient water pressure at said selected depth to said materials stored therein,

said facility further including pressure transfer means for increasing pressure applied to said materials stored in said tank means to achieve a total pressure which promotes and aids maintenance of liquid state of said materials,



said tank means further including an extensible, seawater impermeable membrane extending between said two parts to form an enclosed space to seal off seawater from surfaces of said parts which slide relative to each other in sealing engagement, and,

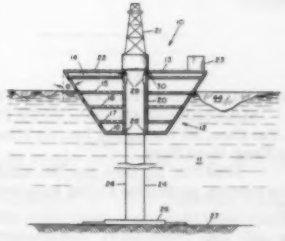
balancing fluid means in said enclosed space at a pressure equalized with ambient seawater pressure for providing further thermal insulation and for isolating said surfaces from contact by seawater throughout the range of slide movement of said two parts.

4,433,941

STRUCTURE FOR OFFSHORE EXPLOITATION

Ben C. Gerwick, Jr., Oakland, Calif., and Stephen J. Hatcher, Duncanville, Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 147,998, May 12, 1980, abandoned.
This application Dec. 20, 1982, Ser. No. 451,372
Int. Cl.³ B63B 35/08; E02B 17/00
U.S. Cl. 405—211 **10 Claims**



1. An offshore structure adapted for operating in a body of water containing floating ice masses at least part of the year, said structure comprising:

a floating hull having downwardly and inwardly sloping sides adapted for breaking said ice masses when contacted thereby;

a conduit extending vertically and centrally through said hull;

mooring means connected to said hull and extending substantially vertically from said conduit to the marine bottom underlying said hull;

means for anchoring said mooring means to said marine bottom directly below said hull; and

means on said hull for tensioning said mooring means and

maintaining said hull downwardly in said body of water at a position below said hull's normal buoyant position when ice mass is not of concern, and for relaxing tension on said mooring means when desirable to rock said hull against an ice mass.

4,433,942

WHARF FENDER

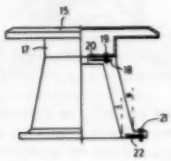
Graeme E. Russell, Bridgeman Downs, and Brian S. Smith, Wavell Heights, both of Australia, assignors to Queensland Rubber Company Pty. Ltd., Australia

Filed Sep. 8, 1981, Ser. No. 299,680

Claims priority, application Australia, Sep. 25, 1980, PE5755

Int. Cl.³ E02B *3/22*; B63B *59/02*

U.S. Cl. 405—215 **16 Claims**



1. A wharf fender assembly comprising: an elongate tubular fender body adapted for attaching to an adjacent wharf; said fender body having a circumferentially continuous sidewall and being of generally increasing width or transverse dimensions from one end to the other end thereby providing a larger end and a smaller end, said fender body being formed from resiliently deformable material; buffer means associated with the fender body for absorbing impact from a ship or other vessel when the fender body is attached to a wharf; and a rigid spacer attached to the fender body at the smaller end thereof which facilitates the attainment of a state of maximum compression of the fender body upon impact, said rigid spacer having an outer diameter about equal to or less than the inner diameter of said fender body at its larger end, whereby said rigid spacer may be collapsed to a point closely adjacent the wharf to attain maximum compression of said fender body upon impact.

4,433,943

METHOD AND APPARATUS FOR FORMING SUBTERRANEAN CONCRETE PILES

Paul C. Pao Chen, 3D Wang Fung Ter., 1st Floor, Tai Hang Rd., Hong Kong, Hong Kong

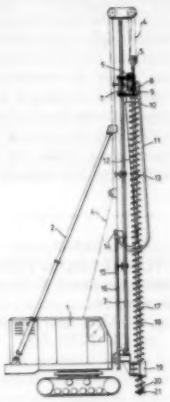
Filed Feb. 12, 1980, Ser. No. 120,879

Claims priority, application United Kingdom, Feb. 13, 1979, 7905127

Int. Cl.³ E02D *5/34*

U.S. Cl. 405—241 **3 Claims**

1. A method for forming a pile in the ground with a sectional helical auger having a central stem in the form of a tubular member which permits the conveying of concrete forming material and a means for conveying compressed air and water from the top of the auger to the bottom of the auger, said method comprising the steps of: forming a hole in the ground with the helical auger; introducing dry concrete-forming material into the hole in the ground through the tubular member positioned in the hole; conveying water from the top of the auger to the bottom of the auger where the water is mixed with the dry concrete-forming material passing through the tubular member to form concrete; forceably ejecting the concrete from the tubular member by means of a substantially continuous flow of compressed air supplied to a nozzle that directs the flow of air into the tubular member adjacent the lower open end thereof; and gradually withdrawing the tubular member from the hole as the hole is filled with concrete.



4,433,944

STRUCTURAL COMPONENTS FOR CONSTRUCTING A WALL

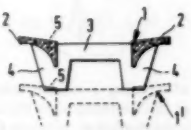
Peter Plica, Munich; Karl Schmöller, Haar, and Gerd Dresp, Munich, all of Fed. Rep. of Germany, assignors to Dyckerhoff & Widmann Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Feb. 17, 1982, Ser. No. 349,457

Claims priority, application Fed. Rep. of Germany, Feb. 21, 1981, 3106486

Int. Cl.³ E02D *5/00*

U.S. Cl. 405—284 **15 Claims**



1. Structural components having a frame or grid-like structure are used for constructing a sound suppression barrier or the like with each said structural component comprising a pair of horizontally extending laterally spaced elongated runner elements, and connecting elements extend transversely of and interconnect said runner elements, each said runner element has a generally upwardly extending first surface facing toward said first surface on the other said runner element of said pair, a generally horizontally disposed second surface extending from said first surface outwardly away from the other said runner element of said pair, and a downwardly facing third surface extending from the lower end of said first surface to the outer end of said second surface, said third surface has a generally concave curvature extending between said first surface and said second surface with the end of the concavely curved third surface adjacent said second surface being located upwardly from the end of said concavely shaped third surface adjacent the lower end of said first surface so that said concavely shaped third surface faces outwardly away from said concavely shaped third surface of the other said runner element of said pair and also in the downward direction so that sound waves impinging on said concavely shaped third sur-

faces are reflected in the downward direction from said third surfaces and are not directed back toward the source of the sound waves.

4,433,945

METHOD AND APPARATUS FOR CONTROLLING A MINE ROOF SUPPORT

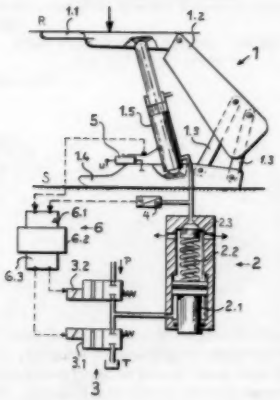
Hermann Irresberger, Essen, Fed. Rep. of Germany, assignor to Bergwerksverband GmbH, Essen, Fed. Rep. of Germany

Filed Nov. 12, 1981, Ser. No. 320,712

Claims priority, application Fed. Rep. of Germany, Nov. 13, 1980, 3042749

Int. Cl.³ E21D *23/16*

U.S. Cl. 405—302 6 Claims



1. A method of controlling a mine roof support including a sole plate resting on the sole of a mine gallery, a roof shield engaging the roof of the mine gallery, and pressure fluid-operated extensible and collapsible prop means extending between the sole plate and the roof shield for pressing the latter against the roof of the mine gallery and having at least one elongated cylinder element and a piston reciprocally arranged in said one cylinder element and dividing the latter into two compartments, into one of which pressure fluid is to be fed for extending the prop means, the method comprising the steps of providing an overpressure valve and connecting said valve with said one compartment, said overpressure valve developing an opening pressure which controls pressure in said one compartment; measuring the inclination of said prop means with respect to the sole plate or measuring the extended length of said prop means; transporting the thus measured value into a control command and transmitting said control command to said overpressure valve to adjust said opening pressure in dependence on the inclination of said prop means with respect to said sole plate or the extended length of said prop means, so that during extension of said prop means to press the roof shield against the roof of the mine gallery further extension of said prop means is automatically stopped when the pressure in said one compartment reaches a controlled opening pressure of said overpressure valve.

4,433,946

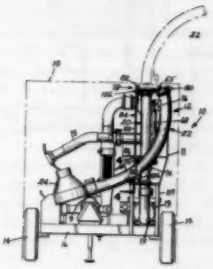
DISCHARGE SYSTEM FOR GRAIN HANDLING APPARATUS

Roy O. Christianson, and Ted T. Christianson, both of Blomkest, Minn., assignors to Christianson Systems, Inc., Blomkest, Minn.

Filed Jul. 21, 1981, Ser. No. 285,465

Int. Cl.³ B65G *67/20*

U.S. Cl. 406—43 5 Claims



1. In a transportable vehicle having a transit profile with a height and width perpendicular to the direction of travel, said vehicle having a discharge spout extending beyond said profile when said spout is in an operational configuration, the combination comprising:

a pair of tubes having proximate first ends, said tubes being axially aligned at said first ends along a first axis to define the operational configuration,

means for connecting said first ends, said connecting means including means for pivoting one of said tubes with respect to the other between the operational configuration and a transit configuration, said transit configuration including portions of said tubes passing one another, said pivoting means includes a second axis disposed in a first plane extending generally transversely through said first axis but skewed with respect to a second plane which is perpendicular to said first axis, whereby said tubes are compactly positioned for easy transit.

4,433,947

SLURRY FEED PUMP FOR COAL LIQUEFACTION REACTORS

Adolf Kratzer, Nuremberg, and Horst Dünnebier, Oberasbach, both of Fed. Rep. of Germany, assignors to Klein, Schanzlin & Becker Aktiengesellschaft, Frankenthal, Fed. Rep. of Germany

Filed Sep. 22, 1981, Ser. No. 304,693

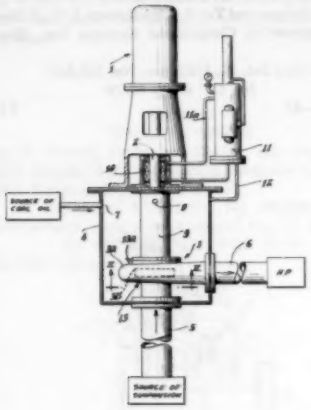
Claims priority, application Fed. Rep. of Germany, May 7, 1981, 3117993

Int. Cl.³ F04B *49/04*

U.S. Cl. 406—99 16 Claims

1. Apparatus for conveying a suspension which contains granulated solid particles to a plant, particularly for conveying a highly pressurized and hot suspension of coal particles, oil and a catalyst to a liquefaction reactor, comprising a liquid-filled plenum chamber, a vertical cantilevered centrifugal pump installed in said chamber for operation below first critical speed and having an inlet and an outlet; first conduit means sealingly extending into said chamber and connected with said

inlet to deliver a stream of suspension to said pump; and second conduit means sealingly extending from said chamber and



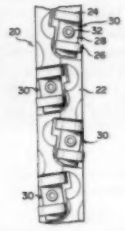
connected with said outlet to convey pressurized suspension to the plant.

4,433,948

CUTTER FOR A CRANKSHAFT MILLING MACHINE

Kazuo Kodama, Komatsu, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Nov. 12, 1981, Ser. No. 320,690
Int. Cl.³ B26D *1/00*
U.S. Cl. 407—42 **4 Claims**



1. A milling cutter for a crankshaft machine for milling a crankshaft having a plurality of main bearings, crank bearings and webs connecting each crank bearing to adjacent main bearings, each end of the bearings having a rounded corner connected to a side wall of a shoulder which, in turn, is connected to a side wall of one of the webs, the milling cutter comprising:

a disk having two end faces and a peripheral mounting face; and

a plurality of tip sets detachably mounted on the mounting face of said disk in a zigzag fashion forming two rows of said tip sets, each row being offset towards either one of end faces of said disk, each of said tip sets comprising:

a generally square-faced tip arranged to machine the main and crank bearings and the rounded corners of the bearings, said square-shaped tip having four rounded corners, one end of each rounded corner being tangent to one side of the tip and the other end thereof crossing another side of the tip and wherein said square-shaped tip is mounted on the mounting face of said disk in such a way that the other end of the rounded corner which is radially and axially outwardly positioned faces sideways thereby preventing the other side of the tip from interfering with the side wall of the shoulder;

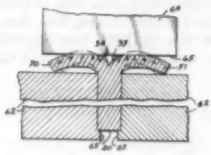
a forming tip arranged to machine the side walls of the webs, the shoulders, the rounded corners and the main and crank bearings; and means to fasten said tip sets to the mounting face of said disk.

4,433,949

SPLIT HEAD FASTENER

Robert L. Hallock, 7136 NE. 8th Dr., Boca Raton, Fla. 33431

Filed Aug. 31, 1981, Ser. No. 298,223
Int. Cl.³ F16B *15/00*
U.S. Cl. 411—477 **9 Claims**



1. A split head fastener constructed of sheet metal having a predetermined thickness comprising an integrally connected head and shank, said shank having an uppermost portion and a tip, said uppermost portion of said shank having a thickness substantially equal to that of the sheet metal, said head having two substantially identical halves which are integrally connected to said uppermost portion of said shank, said halves of said head being separated by a groove which extends generally transversely with respect to said thickness of said uppermost portion of said shank, each of said halves having at least a portion disposed perpendicular to the elongated axis of said shank and being greater in thickness than one-half the thickness of said uppermost portion of said shank.

4,433,950

SELF-FEEDING APPARATUS AND METHOD

James E. Hanger, and Charles T. Walker, both of Panama City, Fla., assignors to Charles Tillman Walker, Lynn Haven, Fla.

Filed Jun. 29, 1981, Ser. No. 278,858
Int. Cl.³ A47G *21/08*
U.S. Cl. 414—9 **15 Claims**

8. A self-feeding apparatus comprising:

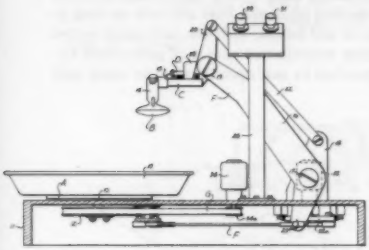
a rotatable table for carrying a plate holding food;

a spoon;

an arm carrying said spoon;

latch means releasing said spoon permitting same to be lowered by gravity into said plate; and

linkage means for progressively lowering said arm after said latch means releases said spoon causing said spoon to



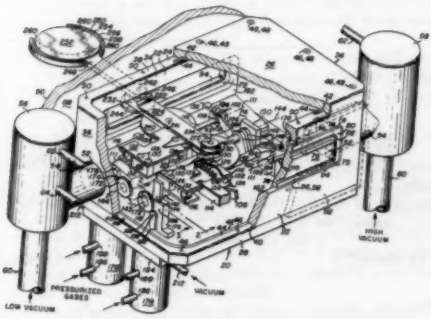
move forwardly or outwardly against said plate for placing food on said spoon.

4,433,951

MODULAR LOADLOCK

George R. Koch, Los Altos, and Carl T. Petersen, III, Fremont, both of Calif., assignors to Lam Research Corporation, Fremont, Calif.

Filed Feb. 13, 1981, Ser. No. 234,307
Int. Cl.³ C23C *13/08*
U.S. Cl. 414—217 **10 Claims**



1. A loadlock comprising:

a sealable isolation chamber having walls through which is formed a first aperture for conducting fluids into or out of the chamber, said walls also having formed therethrough a plurality of workpiece transfer apertures for permitting the introduction of a workpiece into the isolation chamber and removal of a workpiece therefrom, said walls about said workpiece transfer aperture being adapted to mate with and to seal to an immediately adjoining wall such as may be part of a processing chamber;

closure means for individually closing and sealing said workpiece transfer apertures including a unitary door adapted to mate with and seal to a substantially planar surface such as may be part of a processing chamber to which the loadlock may be mated and sealed, the door having a substantially planar sealing surface which may be disposed into a workpiece transfer aperture in said walls of the isolation chamber so as to be adjacent to and substantially paralle to a planar surface of a processing chamber to which the loadlock is mated, and sealing surface having a continuous U-shaped trough adapted to receive and retain an O-ring formed therein, said trough being located near said periphery of said planar sealing surface, the door further including a pair of closure lugs projecting from a side of the door opposite to said sealing surface, said lugs being adapted to receive a rod-shaped door closure pin so as to dispose a longitudinal axis thereof substantially parallel to said sealing surface, said pair of lugs being further adapted to receive a first terminal end of a connecting link, the door including a control link projecting from said side of the door opposite to said sealing surface; and O-ring retained within said U-shaped trough of the door; a roller attached to said control link of the door adjacent to said terminal end of said control link farthest from said sealing surface, the roller being attached to be rotatable about an axis substantially parallel to said axis established for a longitudinal axis of a door closure pin by said closure lugs of the door; a track secured within the isolation chamber, the track being adapted to guide the roller to translate only in a direction essentially perpendicular to a planar surface of a processing chamber or sealing plate to which the door mates and seals whereby said axis about which the roller rotates is constrained to a plane of translation substantially perpendicular to a planar surface of a processing chamber or sealing plate to which the door mates and seals, the track being further adapted to restrain the door to be rotatable only about said axis of rotation of the roller attached to said control link of the door; a rod-shaped rotary drive shaft secured within the isolation chamber to be rotatable about an axis substantially parallel to said axis established for a longitudinal axis of a door closure pin by said closure lugs of the door, said axis about which the drive shaft is rotatable also being displaced to a side of said plane of translation of said axis about which the roller rotates; a pair of drive links secured to and projecting outward from the drive shaft, the links being adapted to receive and retain a rod-shaped drive pin to dispose said central longitudinal axis thereof at a distance from and parallel to said axis about which the drive shaft is rotatable, each pair of links being further adapted to receive a second terminal end of a connecting link; a connecting link having a first terminal end adapted to receive a rod-shaped door closure pin, said first terminal end of the link being engaged with said pair of said closure lugs of the door adapted to receive said first terminal end of the connecting link, a second terminal end of the connecting link being adapted to receive a rod-shaped drive pin, said second terminal end of the link being engaged with said terminal ends of the pair of drive links adapted to receive said second terminal end of the connecting link; a door closure pin passing through said pair of closure lugs of the door, said lugs being adapted to receive the door closure pin, the door closure pin also passing through said first terminal end of the connecting link engaged with said pair of closure lugs and adapted to receive the door closure pin; a drive pin passing through said terminal ends of a pair of drive links adapted to receive the drive pin, the drive pin also passing through said second terminal end of the connecting link engaged with the pair of drive links and adapted to receive the drive pin; a coil spring attached at a first terminal end to the door and having a second terminal end secured within the isolation chamber so as to urge the door to translate away from a planar surface of a processing chamber to which the door mates and seals; an L-shaped slide member secured to the door along said side surface thereof from which said closure lugs project and along an edge surface thereof located on an opposite side of the plane of translation of the roller from that on which the rod-shaped rotary drive shaft is located, the slide member being adapted for sliding engagement with a surface of said workpiece transfer aperture formed through said wall of the sealable isolation chamber whereby the door is restrained to translate only in a direction essentially perpendicular to a planar surface of a processing chamber to which the door mates and seals; and rotating drive means for rotating the drive shaft so that the door may be opened and closed, the rotary drive means being operable from outside the chamber;

workpiece transfer means for receiving a workpiece into the isolation chamber through a first open workpiece transfer aperture and for delivering a received workpiece from the isolation chamber through a second open workpiece transfer aperture;

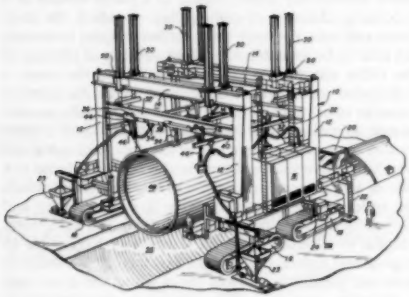
the isolation chamber, the closure means and the workpiece transfer means being constructed such that all said workpiece transfer apertures may be simultaneously closed and sealed with a workpiece present within the isolation chamber whereby a workpiece may be sealed within the loadlock.

4,433,952

TRACKED CRANE FOR LARGE OBJECTS

Myron Glickman, Morton Grove, Ill., assignor to Mi-Jack Products, Inc., Hazel Crest, Ill.

Filed Oct. 23, 1981, Ser. No. 314,122
Int. Cl.³ B66C *5/04*
U.S. Cl. 414—460 **2 Claims**



1. A tracked crane for hoisting and moving large objects, which comprises: a frame including side members and top support member means, tracks adjacent each corner of the frame, means for driving said tracks to permit locomotion of the crane, said tracks being attached to the frame by horizontal pivot means, and jack means for elevating said frame and tracks off of the ground, whereby said tracks, when elevated, can be horizontally pivoted into another direction and then lowered to the ground again, to permit said crane to be driven in another direction without turning; said tracks also have vertical pivot means to allow them to pitch as they travel across uneven terrain; said top support member means carries pressure cylinder lifting means, the pressure cylinders of said lifting means carrying vertically movable, generally horizontal stabilizing beam means; trolley means, movable along said stabilizing beam means is provided, said trolley means being adapted for carrying flexible members for connecting to and carrying a load; and means are provided for pressing on the top of the load carried by said crane to prevent bouncing of the load supported by said flexible member, as the crane travels and to hold the load down during its installation as necessary.

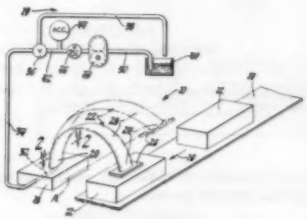
4,433,953

INDUSTRIAL ROBOT HAVING A JOINT-FREE ARM

Nils L. Muench, Bloomfield Hills, Mich., assignor to General Motors Corporation, Detroit, Mich.

Continuation of Ser. No. 360,628, Mar. 22, 1982, abandoned. This application Jul. 11, 1983, Ser. No. 512,694
Int. Cl.³ B66C *1/00*
U.S. Cl. 414—735 **4 Claims**

1. A robot adapted to be positioned adjacent a support table for performing work on a series of articles, said robot comprising a base rigidly supporting an arm that includes a generally circular tubular member sealed at its free end and having an opening at its supported end that communicates with the hollow interior of said tubular member, said tubular member being made of a rigid material and having a uniform cross-sectional configuration; a hydraulic system including a source of pressurized hydraulic fluid connected to said opening at said supported end of said tubular member; a work tool attached to said free end of said tubular member; and valve means between said source of pressurized hydraulic fluid and said opening at said supported end of said tubular member, said valve means having a first position wherein said source of pressurized hydraulic fluid is connected to said opening so as to cause said



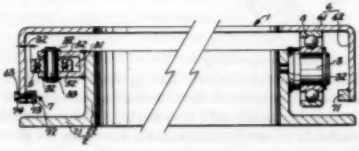
free end of said tubular member to move towards longitudinal alignment with said supported end, and having a second position for connecting said opening to atmosphere so as to cause said tubular member to return said free end to its original position; said work tool adapted to move towards and away from said series of articles successively and perform work thereon as said valve means is moved between said first position and said second position.

4,433,954

APPARATUS FOR ROTATING PALLET

Hiromu Fujita, Kyoto, Japan, assignor to Osaka Taiyu Co., Ltd., Osaka, Japan

Continuation of Ser. No. 147,107, May 6, 1980, abandoned. This application Sep. 27, 1982, Ser. No. 424,181
Int. Cl.³ B65G *7/00*
U.S. Cl. 414—757 **4 Claims**



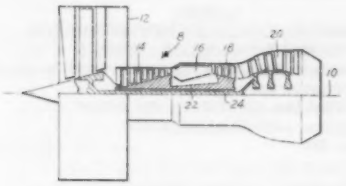
1. A portable apparatus for rotating a pallet consisting of an annular under ring having a flat bottom wall, a peripheral wall extending upwardly from the bottom wall forming an L-shaped cross-section, and a plurality of bearings arranged on a circumference on said peripheral wall, some of said plurality being rotatable in a vertical plane and the others being rotatable in a horizontal plane; and an annular upper ring provided over the under ring and supported rotatably on the bearings rotatable in a vertical plane, the annular upper ring having a flat top wall, a peripheral wall projecting downwardly from the top wall positioned close to the bearings rotatable in a horizontal plane, the top wall and the upper ring peripheral wall forming a L-shape cross-section opposite in orientation to that of said under ring and a retaining ring along the lower edge of the peripheral wall of the upper ring projecting toward void space beneath the bearings rotatable in a horizontal plane.

4,433,955

TURBINE ARRANGEMENT

Richard P. Johnston, Morrow, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Mar. 26, 1981, Ser. No. 247,682
Int. Cl.³ F01D 1/04
U.S. Cl. 415—1 **12 Claims**



9. In a method of arranging a gas turbine engine of the type including a combustor effective for generating combustion gases and a turbine effective for receiving said gases for driving a rotor, said turbine including an annular gas flowpath having a forward portion wherein a mean flow streamline slopes away from an engine longitudinal axis in a downstream direction and a plurality of blade rows and vane rows spaced alternately and within said flowpath, said blade rows extending radially outwardly from said rotor, the steps of:

arranging said blade rows and said vane rows within said forward portion of said flowpath for having radial axes tilted forward at an angle less than 90° from said engine longitudinal axis; and

arranging said annular gas flowpath so that said mean flow streamline of said forward portion of said flowpath has an increased slope for increasing efficiency of transfer of energy from said gases to said rotor.

10. In a gas turbine engine including a combustor effective for generating combustion gases and a turbine effective for receiving said gases for driving a rotor, said turbine including an annular gas flowpath having a forward portion wherein a mean flow streamline slopes away from an engine longitudinal axis in a downstream direction and a plurality of blade rows and vane rows spaced alternately and within said flowpath, said blade rows extending radially outwardly from said rotor, an improved turbine comprising:

said blade rows within said forward portion of said flowpath having radial axes tilted forward at an angle less than 90° from said engine longitudinal axis; and

said forward portion of said flowpath being arranged so that said mean flow streamline of said gases has an increased slope.

4,433,956

ORTHOPEDIC CORRECTOR AND METHOD OF CORRECTION OF CLASS II MALOCCLUSION

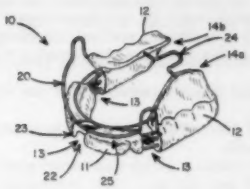
John W. Witzig, 2040 N. Douglas Dr., Golden Valley, Minn. 55422

Continuation-in-part of Ser. No. 287,281, Jul. 27, 1981, abandoned. This application May 3, 1982, Ser. No. 374,440
Int. Cl.³ A61C 7/00
U.S. Cl. 433—7 **8 Claims**

1. An orthopedic appliance for correcting a Class II, Division I, malocclusion comprising:

a. a posterior segment having contoured sides for mating and longitudinally fixed engagement with the interior sides of a person's upper molars;

b. an anterior segment having a contoured leading edge for mating engagement with the inside of the frontal arch of the person's mandible, the leading edge being a ramp which extends angularly outward in a direction from the bottom of the mandible to the top of the mandibular frontal arch, and



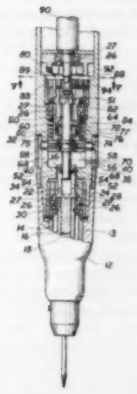
c. an expansion screw assembly connecting the posterior and anterior segment for longitudinally expandible movement between the anterior segment and the posterior segment.

4,433,957

TRANSMISSION GEAR FOR A DENTAL HANDPIECE

Toshimasa Nakanishi, Kanuma, Japan, assignor to Nakanishi Dental Mfg. Co., Ltd., Kanuma, Japan

Filed Feb. 22, 1982, Ser. No. 351,313
Int. Cl.³ A61C 1/02
U.S. Cl. 433—105 **3 Claims**



1. A dental handpiece having a two speed transmission, comprising:

a hollow handle means;

a holding sleeve fixedly held in said handle means;

cylindrical driven shaft means rotatably journalled in said holding sleeve and having a hollow axial cylindrical recess at the rear end and having a diametrical longitudinal slot therethrough;

said handle means having a peripheral recess around the outside of said handle means at the middle portion thereof and at least one spirally extending guide slot therein opening into the interior of said handle means;

a clutch shaft in the interior of said handle means and axially movable therein, said clutch shaft having a cotter at the forward end extending diametrically through said slidable in said slot in said driven shaft means;

a collar having a radially extending pin thereon and rotatably mounted on said clutch shaft at a middle portion thereof and fixed against axial movement along said clutch shaft and having said pin extending through said spiral slot, said clutch shaft further having first engagement means at the rear end thereof;

a coil spring in said interior of said handle means engaged with said collar urging said collar toward said driven shaft

means; a sleeve means rotatably mounted in a fixed position in the interior of said handle means coaxial with said clutch shaft, said clutch shaft having second engagement means engagable with said sleeve for causing rotation of said clutch shaft with said sleeve means when said clutch shaft is in a forward position and disengaged from said sleeve means when said clutch shaft is in a rearward position;

planet gear means mounted on the rear end of said sleeve means;

a central gear within said planet gear means and engaged therewith;

a motor means on which said central gear is mounted, said central gear having a third engagement means thereon engagable with said first engagement means when said gear shaft is in the rearward position; and an operating ring around the handle means in said recess and engagable with said pin for, when said operating ring is rotated, moving said pin along said spiral groove to move said clutch shaft between the forward and rearward positions.

4,433,958

PERMANENT DENTAL RESTORATIVE MATERIAL

Robert P. Fellman, Laughorne; Marvin J. Hurwitz, Elkins Park; Robert M. Myers, Holland, all of Pa., and Gerald F. Slack, Vincentown, N.J., assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 305,417, Sep. 25, 1981, abandoned, which is a continuation-in-part of Ser. No. 128,010, Mar. 7, 1980, abandoned. This application Aug. 26, 1982, Ser. No. 411,778

Int. Cl.³ A61K *6/08*

U.S. Cl. 433—199 **28 Claims**

1. Composition useful for preparing permanent dental restorations having high compressive strength, wear resistance and a coefficient of friction of not greater than 0.3 comprising:

(a) about 10 to 60 parts by weight of a liquid monomer system comprised of one or more monoethylenically unsaturated monomers and about 10% to 80% by weight, based on said liquid monomer system, of one or more polyethylenically unsaturated crosslinking monomers, said monomer system, containing at least 70%, by weight of said monomer system, of acrylic monomer;

(b) about 40 to 90 parts by weight of a mixture of (1) organic polymeric particulate substance insoluble in said liquid monomer system selected from the class consisting of poly(ethylene-co-chlorotrifluoroethylene), poly(vinylidene fluoride), nylon and polyacetal and (2) inorganic particulate substance insoluble in said liquid monomer system wherein the weight ratio of the organic particulate substance to inorganic particulate substance is from about 2:1 to about 10:1; and

(c) a free radical initiator system.

23. A method of making permanent dental crowns having high compressive strength, wear resistance and a coefficient of friction of not greater than 0.3 comprising (I) mixing (a) a first component comprising about 10 to 60 parts by weight of a liquid monomer system comprised of one or more monoethylenically unsaturated monomers and about 10% to about 80% by weight, based on said liquid monomer system, of one or more polyethylenically unsaturated crosslinking monomers, said monomer system containing at least about 70%, by weight of said monomer system, of acrylic monomer, with (b) a second component comprising about 40 to 90 parts by weight of a mixture of (1) organic polymeric particulate substance insoluble in said liquid monomer system and selected from the class consisting of poly(ethylene-co-chlorotrifluoroethylene), poly(-vinylidene fluoride), nylon and polyacetal and (2) inorganic particulate substance insoluble in said liquid monomer system wherein the weight ratio of the organic particulate substance to the inorganic particulate substance is from about 2:1 to about 10:1, said mixing taking place in the presence of a free radical initiator, (II) allowing the resultant mixture to achieve a suitable viscosity, (III) filling a tooth-shaped preformed mold or impression tray with the resultant thickened mixture, and (IV) applying the filled mold or tray to the prepared tooth to which the crown is to be affixed, (V) allowing the composition to set, (VI) removing the resultant set crown from the mouth and then from the mold or impression tray, (VII) finishing and polishing the crown, (VIII) filling the crown with dental cement and placing the dental crown on the prepared tooth.

4,433,959

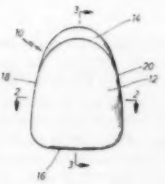
COMPOSITE LAMINATE DENTAL VENEER CONTAINING COLOR SYSTEMS

Frank R. Faunce, Jackson, Miss., assignor to JAFF Investment Company, Muncie, Ind.

Filed Mar. 24, 1982, Ser. No. 361,257

Int. Cl.³ A61K *6/08*

U.S. Cl. 433—201 **16 Claims**



1. A composite laminate dental veneer for attachment to the etched labial enamel surfaces of a human tooth, comprising:

(a) an outer lamination composed of stain-resistant, chemical-resistant and erosion-resistant cross-linked polymer material;

(b) an inner lamination composed of a non cross-linked polymer material having the capability of efficient bonding to the etched labial enamel surfaces of human teeth and having the capability of permanent bonding to said outer lamination, said inner and outer laminations defining integral mass, said lamination defining incisal, cervical and marginal edges and conforming to the configuration of the labial surface of said human tooth;

(c) said outer lamination being translucent and having additive color pigments; and

(d) said inner lamination having subtractive color pigments.

4,433,960

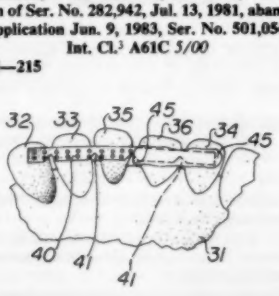
EXTRACORONAL DENTAL SPLINT AND SPLINTING METHOD

Jon C. Garito, 22 Deering La., East Rockaway, N.Y. 11558, and Alan G. Ellman, 1 Auerbach La., Lawrence, N.Y. 11516

Continuation of Ser. No. 282,942, Jul. 13, 1981, abandoned. This application Jun. 9, 1983, Ser. No. 501,054

Int. Cl.³ A61C *5/00*

U.S. Cl. 433—215 **11 Claims**



7. An extracoronal dental splinting procedure for immobilizing one or more intermediate mobile teeth in a continuous row

of at least four teeth without any missing teeth and with at least the end teeth being immobile, comprising the steps of:

a. providing a thin flat substantially straight slightly malleable strip having holes therein and having a length sufficient to span the entire row,

b. without cutting or drilling any of the teeth, fitting the strip to the lingual surfaces of an inner dental arch of the patient so as to overlie the row of at least four teeth including the end immobile teeth and at least one intermediate mobile tooth,

c. without cutting or drilling any of the teeth, applying the strip to the said inner dental arch defined in step b,

d. while holding the strip against the inner dental arch, smoothing a hardenable creamy-type resin or composite material over the entire held strip so as to fill the holes therein and contact the tooth surfaces against which the strip is held, and

e. while still retaining the strip against the inner dental arch, allowing the hardenable material to harden firmly bonding the strip to the said row of immobile and mobile teeth along the inner dental arch and stiffening the strip to stabilize the mobile tooth.

4,433,961

HUMAN KNEE MODEL SUITABLE FOR TEACHING OPERATIVE ARTHROSCOPY AND HAVING REPLACEABLE JOINT

Eugene J. Chandler, 5702 E. Camelback Rd., Phoenix, Ariz. 85018

Continuation-in-part of Ser. No. 187,509, Sep. 15, 1980, Pat. No. 4,331,428. This application Apr. 8, 1982, Ser. No. 366,474

The portion of the term of this patent subsequent to May 25, 1999, has been disclaimed.

Int. Cl.³ G09B *23/30*

U.S. Cl. 434—274 **34 Claims**

1. A method of producing a model of the human knee having a replaceable knee joint, the model being suitable for learning and practicing arthroscopic surgical techniques, said method comprising the steps of:

a. providing a bovine leg having femur and tibia bones, the femur and tibia bones having a lower extremity and an upper extremity, respectively, the bovine leg including a knee joint formed between the lower extremity of the femur bone and the upper extremity of the tibia bone;

b. modifying the knee joint of the bovine leg to facilitate the insertion of an arthroscope into the knee joint;

c. severing the bovine femur and tibia bones closely proximate the lower and upper extremities, respectively, thereof while leaving the modified knee joint intact;

d. releasably securing the lower extremity of the severed bovine femur bone to the lower end of an upper support member, and releasably securing the upper extremity of the severed bovine tibia bone to the upper end of a lower support member;

e. surrounding the modified knee joint and at least the upper and lower ends of the lower and upper support members, respectively, with a synthetic flexible, fluid-impervious covering; and

f. sealing the covering to allow continuous irrigation of the knee joint.

4,433,962

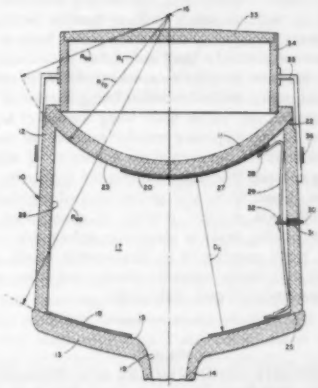
PROCESS FOR MAKING ENVELOPE FOR PROJECTION TELEVISION TUBE

Henry E. Kloss, 174 Brattle St., Cambridge, Mass. 02133

Division of Ser. No. 234,913, Feb. 17, 1981, Pat. No. 4,365,183, which is a continuation of Ser. No. 875,222, Feb. 5, 1978, abandoned. This application Sep. 7, 1982, Ser. No. 415,397

Int. Cl.³ C03B *23/217*; H01J *31/00, 29/24*

U.S. Cl. 445—6 **8 Claims**



1. A process for making an envelope for a projection television tube including a tube neck and an end plate adjacent the tube neck; a spherically curved electron beam target spaced from the end plate within the envelope; a reflective surface larger than the target and located adjacent the end plate in concentric relationship with and facing the target surface; a target support member supporting the target surface in the envelope and a hollow cylindrical member extending along the tube axis between the end plate and the target support for maintaining the spacing between the target surface and the reflective surface, comprising the steps of:

(a) providing joint surface areas on the opposite ends of the cylindrical member and the adjacent peripheral areas of the target support member and end plate that lie at least in part on spherically curves surfaces that are concentric with said target and reflective surfaces;

(b) placing the cylindrical member on the end plate and placing the target support with the target surface attached thereto on the cylindrical member so that said joint surface areas lying on said spherically curved surfaces are contiguous;

(c) bonding the end plate, cylindrical member and target support member together by using a high temperature fusible frit between the joint surfaces; heating the cylindrical member, end plate and target support to the fusing temperature of the frit; and cooling the assembly.

4,433,963

CHAIN GUIDE FOR A DERAILLEUR FOR A BICYCLE

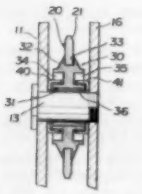
Keizo Shimano, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Dec. 22, 1980, Ser. No. 218,803

Claims priority, application Japan, Dec. 29, 1979, 54-184225[U]

Int. Cl.³ F16H 7/22, 11/08

U.S. Cl. 474—80 **4 Claims**



1. A chain guide for a speed changing derailleur for a bicycle, said chain guide comprising a pulley plate, pulley shafts fixed to said plate, and pulleys supported rotatably to each of said pulley shafts respectively, said pulleys each being provided with an annular pulley toothed member having at its outer periphery a number of teeth and a pulley body having at a central portion thereof a shaft bore fitted onto a said pulley shaft and at the outer periphery a support portion for said tooth member, said pulley toothed member being formed of a wear resistant material, said pulley body being formed of an elastic material and having opposing annular recesses on each side thereof which define between them a portion of said body which has a reduced thickness, said recesses facilitating elastic deformation of said body, said pulley toothed member being coupled with said support portion at said pulley body, whereby said pulley body is elastically deformable enabling said pulley tooth member to be displaceable axially of said pulley shaft and freely rotatable during and after a speed changing movement of said chain guide.

4,433,964

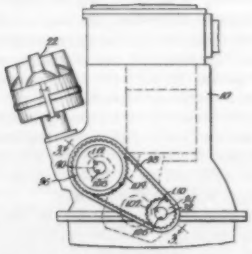
COMPOSITE TIMING GEARS AND PROCESS

Matthew W. Holtzberg, Ringwood, N.J.; Steven J. Henke, Woodridge, and Lawrence D. Spaulding, Naperville, both of Ill., assignors to Standard Oil Company, Chicago, Ill.

Filed Jun. 11, 1982, Ser. No. 387,290

Int. Cl.³ F16H 55/06

U.S. Cl. 474—152 **29 Claims**

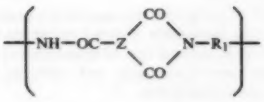


1. Composite timing gears, comprising:

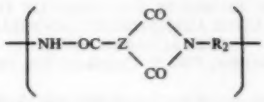
a thermoplastic, amide-imide resinous polymeric crankshaft gear having teeth and defining a hole for snuggly receiving a crankshaft;

a thermoplastic amide-imide resinous polymeric camshaft gear having teeth for meshingly engaging and being driven by said teeth of said crankshaft gear and defining a hole for snuggly receiving a camshaft;

each of said gears comprising a reaction product of a trifunctional carboxylic acid compound and at least one diprimary aromatic diamine and comprising at least one of the following moieties:



and



wherein one carbonyl group is meta to and one carbonyl group is para to each amide group and wherein Z is a trivalent benzene ring or lower-alkyl-substituted trivalent benzene ring, R_1 and R_2 are different and are divalent aromatic hydrocarbon radicals of from 6 to about 10 carbon atoms or two divalent aromatic hydrocarbon radicals of from 6 to about 10 carbon atoms joined directly or by stable linkages selected from the group consisting of —O—, methylene, —CO—, —SO_2—, and —S— radicals and wherein said R_1 and R_2 containing units run from about 10 mole percent R_1 containing unit and about 90 mole percent R_2 containing unit to about 90 mole percent R_1 containing unit and about 10 mole percent R_2 containing unit; and

said thermoplastic crankshaft and camshaft gears maintaining their shape and structural integrity at engine operating conditions.

17. A process for forming a composite timing gear for use in an engine, comprising the steps of:

inserting a removable core pin along an axis in a cavity of a mold providing a die to define a generally gear-shaped molding chamber;

injection molding a thermoplastic, amide-imide resinous polymer to form a gear-shaped blank having teeth and a diaphragm covering a hole for receiving a shaft, said injection molding including injecting said amide-imide polymer into said cavity through a sprue at a location generally opposite said core pin along said axis to substantially fill said gear-shaped molding chamber about said core pin and substantially minimize knit lines in said amide-imide gear-shaped blank;

solidifying the shape and polymeric orientation of said amide-imide gear-shaped blank by allowing said amide-imide gear-shaped blank to cool below its plastic deformation temperature;

removing said core pin from said mold;

post curing said amide-imide gear-shaped blank by solid state polymerization to enhance the strength and integrity of said amide-imide gear-shaped blank; and

removing said diaphragm covering said hole to form said composite timing gear.

4,433,965

TORQUE TRANSMISSION BELT MEANS

Yoshiyuki Hattori, Toyoake; Kazuma Matsui, Toyohashi, and Hiroji Kinbara, Aichi, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Feb. 23, 1981, Ser. No. 237,261
Claims priority, application Japan, Feb. 25, 1980, 55-23015
Int. Cl.³ F16G *1/00, 1/20*
U.S. Cl. 474—201 10 Claims

1. A torque transmission belt extending between a drive pulley and a driven pulley and movable for transmitting a driving force from said drive pulley to said driven pulley, comprising:

a ring extending around said pulleys; and

a series of blocks arranged along said ring and shiftably engaged therewith, said series of blocks being composed of two kinds of blocks alternately arranged along said ring:

one kind of blocks being made of non-compressive material having high strength and being provided with opposed side surfaces which contact said pulleys as the belt moves; and

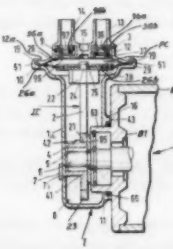
the other kind of blocks being made of elastic material formed so that the distance between opposed side surfaces facing said one kind of blocks is decreased toward the inside of said ring.

4,433,966

DIAPHRAGM PUMP

Klaus D. Krumm, Bühl, Fed. Rep. of Germany, assignor to Luk Lamellen und Kupplungsbau GmbH, Bühl, Fed. Rep. of Germany

Filed Dec. 2, 1981, Ser. No. 326,564
Claims priority, application Fed. Rep. of Germany, Dec. 6, 1980, 3046028
Int. Cl.³ F04B *39/02, 21/02;* F01B *19/02*
U.S. Cl. 417—571 19 Claims



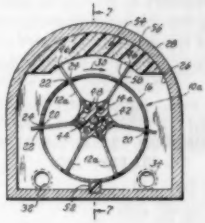
1. In a diaphragm pump, the combination of a housing; a flexible diaphragm installed in said housing and including a central portion having an aperture; and means for flexing said diaphragm, comprising a rotary eccentric in said housing, a one-piece elongated connecting rod having an annular first end portion surrounding said eccentric, a carrier remote from said first end portion and a second end portion extending from said carrier and through the aperture of said central portion, a first substantially disc-shaped biasing element having an opening through which said second end portion extends, and a second substantially disc-shaped biasing element having an opening through which said second end portion extends, said second biasing element being disposed between said carrier and said central portion and said central portion being disposed between said biasing elements, said carrier and said second end portion including a part outwardly adjacent to said first biasing element and arranged to urge said biasing elements and said central portion toward said carrier, said carrier having an elongated substantially undulate surface extending substantially transversely of the longitudinal extension of said connecting rod and abutting against said second biasing element.

4,433,967

PUMP IMPELLER

Lawrence B. Craig, 116 Duck Pond Rd., Glen Cove, N.Y. 11542, and Alfred J. Farina, 1939 Anita Ct., Baldwin, N.Y. 11510

Filed May 17, 1982, Ser. No. 378,636
Int. Cl.³ F01C *5/04;* F04C *27/00*
U.S. Cl. 418—140 3 Claims



1. In an impeller for a centrifugal pump of the type having an operative position rotatably mounted in a pumping chamber in said pump and consisting of an elastomeric hub and plural vanes circumferentially spaced to extend in radial relation from said hub, the improvements to said impeller comprising each vane being of a geometric shape and operatively disposed with a first outer edge thereof moving through a rotative path about the periphery of said pumping chamber and said opposite second inner edge thereof molded in situ in said elastomeric hub with the area of said vane extending between said first and second edges adapted to exert pressure against fluid being pumped during pumping service of said pump, and for each said vane a compartment formed in said hub by the absence of elastomeric material in an area coincident with and extending along the length of said second edge so as to permit unimpeded movement of said second edge in said compartment, whereby in response to changing angular orientations of the vanes in said elastomeric hub the said resulting movement in said second edge by being unimpeded is with minimum stretching and compression in said surrounding elastomeric material of said hub and correspondingly contributes to obviating any rupture in said hub.

4,433,968

ROUND TOP RIMMING MACHINE

Eugene A. Koll, Mounds View, Minn., assignor to Champion International Corporation, Stamford, Conn.

Filed Mar. 15, 1982, Ser. No. 357,837
Int. Cl.³ B29C *17/02*
U.S. Cl. 425—392 18 Claims

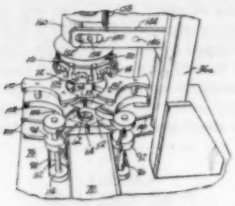
1. An apparatus for forming a cup edge comprising in combination:

a means for forming the rim of a cup having an annular sidewall and a polygonal base,

means for supporting said cup in register with said means for forming,

means for relatively moving said cup and said means for supporting said cup in register toward said means for

forming to place said rim in contact with said means for forming,



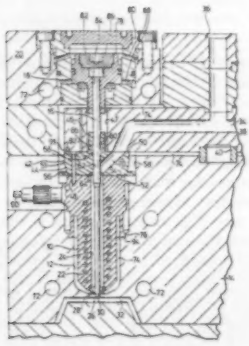
said means for supporting said cup in register including a socket complementary to said polygonal base to prevent rotation of said cup relative to said socket when said cup is seated in said socket.

4,433,969

INJECTION MOLDING VALVE PIN BUSHING AND METHOD

Jobst U. Gellert, 7A Prince St., Glen Williams, Ontario, Canada

Filed Jul. 19, 1982, Ser. No. 399,770
Claims priority, application Canada, Jul. 12, 1982, 407095
Int. Cl.³ B29F 1/03
U.S. Cl. 425—548 7 Claims



1. In a valve gated injection molding system having a heated nozzle seated in a well in a cooled cavity plate, a gate in the cavity plate leading to a cavity, the heated nozzle having a bore extending therethrough from a first surface into alignment with the gate, an elongated valve pin which reciprocates in the bore in the heated nozzle, actuating mechanism for driving the valve pin between open and closed positions, a melt passage which extends through a manifold plate and around the valve pin in the bore in the heated nozzle to convey pressurized melt from a molding machine to the gate, the improvement further comprising:

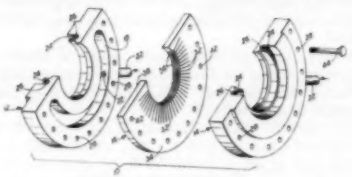
a valve pin bushing having a main body portion located between the manifold plate and the heated nozzle, the main body portion having first and second opposed surfaces and an outer periphery, a portion of the first surface abutting against the manifold plate and at least a portion of the second surface abutting against the first surface of the heated nozzle, the main body portion of the valve pin bushing having a melt duct which forms a portion of the melt passage which conveys melt to the heated nozzle and a valve pin bore which extends therethrough from the first surface to the second surface, the valve pin bushing bore having an enlarged portion extending to said second surface in alignment with the heated nozzle bore, the valve pin bushing melt duct joining the valve pin bushing bore at said enlarged portion whereby the pressurized melt flows around the valve pin to the heated nozzle, the pin bushing bore receiving the valve pin therethrough whereby substantial leakage of the pressurized melt is prevented around the reciprocating valve pin with sufficient clearance provided between the valve pin and the manifold plate to avoid misalignment of the valve pin due to thermal expansion of the manifold plate, the valve pin bushing being securely fixed to the heated nozzle with the second surface of the main body portion abutting against the first surface of the heated nozzle and a sufficient portion of the outer periphery of the main body portion of the valve pin bushing being in an abutting relationship with the surrounding cavity plate to laterally locate the valve pin bushing relative to the cavity plate.

4,433,970

METHOD OF HEATING A LIGHTGUIDE PREFORM

Carroll D. Spainhour, Princeton, N.J., assignor to Western Electric Co., Inc., New York, N.Y.

Division of Ser. No. 300,356, Sep. 8, 1981, Pat. No. 4,401,267.
This application Apr. 25, 1983, Ser. No. 488,313
Int. Cl.³ F23M 3/02
U.S. Cl. 431—8 4 Claims



1. A method of heating a lightguide preform, comprising the steps of:

directing first and second gases into first and second plenums, respectively, of a torch, said plenums being separated by a plate;

passing said gases along respective grooves on opposed major surfaces of said plate to the surface of the torch; and

igniting the gases to heat said lightguide preform.

4,433,971

INTEGRATED CARDIOPLEGIA DELIVERY SYSTEM

Erin J. Lindsay, and Jeffrey T. Snyder, both of Dexter, Mich., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

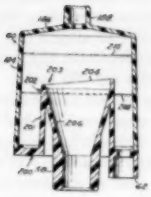
Filed Jun. 30, 1981, Ser. No. 279,174
Int. Cl.³ A61M 1/00, 5/00, 5/16
U.S. Cl. 604—122 8 Claims

1. In a cardioplegia system in which cardioplegia medication or a mixture of arterial blood and medication is delivered to the heart of a patient during open heart surgery, and including a cooling medium and apparatus for cooling the cardioplegic fluid flowing to the heart, an improvement in a bubble trap having an inlet connected to the cooling apparatus and an outlet leading to the heart cannula which comprises:

(a) an upright cylindrical chamber formed of transparent material having a top wall with a connection port, a bottom wall with an outlet port, and upright side walls connecting said top wall and said bottom wall,

(b) an entrance well supported at the bottom wall extending upwardly into said chamber having an upper overflow rim located between the top and bottom walls and spaced from the side walls of the chamber, said entrance well

having an inlet opening for cardioplegia fluid, said overflow rim of said well being shaped to discharge entering



fluid toward one side of said chamber, and said one side of said chamber being on the side of the chamber away from said outlet port in said bottom wall.

4,433,972

SANITARY NAPKIN

Amanda Malfitano, 161-77th St., Brooklyn, N.Y. 11209

Filed Jun. 1, 1981, Ser. No. 269,392

Int. Cl.³ A61F *13/16*

U.S. Cl. 604—385 **5 Claims**

1. A sanitary napkin comprising an absorbent pad assembly, including a first absorbent pad for underlying the crotch area of the user, and a second absorbent pad of lesser fluid retention ability and of a size to permit partial penetration of a vaginal orifice disposed on said first pad for immediate contact with the genital area of the user, said second pad conforming generally to the contour of the genital area of the user, said second pad being thicker and wider at its center forming an apex, said first pad being hourglass shaped to assist the penetration of the vaginal orifice by said second pad, and having a width at its narrowest point at the crotch area substantially the same as the width of the widest portion of said second pad.

4,433,973

REUSABLE TUBE CONNECTOR ASSEMBLY

Leonard D. Kurtz, Woodmere, and Joseph M. LiCausi, Port Jefferson Sta., both of N.Y., assignors to BioResearch Inc., Farmingdale, N.Y.

Filed Jan. 12, 1982, Ser. No. 338,834

Int. Cl.³ A61M *5/14, 1/02*

U.S. Cl. 604—403 **11 Claims**

1. A mating two-part connector assembly for connecting two tubes or the like which prevents the entry of contaminates in the tubes during use and subsequent reuse of one part of the two part connection assembly, the connector assembly comprising:

a reusable first connector member including

an elongate housing having a distal end and a proximal end, said elongate housing further having an elongate opening in the proximal end thereof;

a bore through said elongate housing located coaxially with the longitudinal axis of said housing;

an adapter located around said bore on the distal end of said housing, said adapter being sized to secure one of the tubes thereto; and

a sterile inner tubing located around said bore and inside of said housing, said inner tubing being spaced inwardly from the proximal end of said housing and also spaced inwardly from the surrounding portion of said housing adjacent thereto;

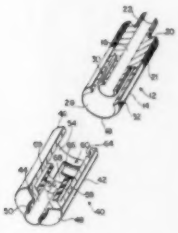
a reusable second connector member including

an elongate housing having a distal end and a proximal end, said elongate housing further having an elongate opening in the proximal end thereof which is sized such that said housing of said second connector member telescopically receives a portion of the proximal end of said housing of said first connector member;

a bore through said elongate housing located coaxially along the longitudinal axis of said housing;

an adapter located around said bore on the distal end of said housing, said adapter being sized to secure the other of the tubes thereto;

a sterile inner tubing located around said bore and inside of said housing, said inner tubing being spaced inwardly



from the proximal end of said housing and also spaced inwardly from the surrounding portion of said housing adjacent thereto; and

a cover tubing located around said sterile inner tubing of said second housing and extending outwardly beyond the inwardly spaced end of said inner tubing, said cover tubing further being spaced inwardly from the proximal end of said housing and from the surrounding portion of said housing adjacent thereto such that the proximal end of said first housing cannot contact said cover tubing at any insertion angle and said first housing is spaced from said cover tubing after said first and second connector members have been connected, the portion of said cover tubing extending outwardly from said inner tubing being sized to snuggly and telescopically receive a portion of said inner tubing of said first housing; and

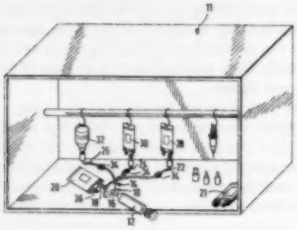
a connecting means for separably holding said first connector member and said connector member together such that a portion of said first housing is located inside of said second housing and a portion of said first inner tubing is located inside of said cover tubing and is abutting said second inner tubing and such that after disconnection and a subsequent reuse of one of said connector members with a mating connector member, the sterility of said inner tubing of the one of said connector members is maintained.

4,433,974

MIXING SYSTEM FOR PARENTERAL LIQUIDS

Reinhard Bischof, Baldham, Fed. Rep. of Germany, assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Jun. 17, 1981, Ser. No. 274,710
Int. Cl.[3] G05D 9/00; A61J 1/00
U.S. Cl. 604—407 3 Claims



1. A system for preparing parenteral liquid comprising:
at least a pair of supply containers;
at least a pair of conduits connected to and communicating with said respective supply containers each containing different substrates of parental liquid, each conduit having a tube clamp thereon for individually blocking the conduit to permit said substrates to be delivered separately through said conduits,
a multiple valve including an outlet, an inlet/outlet connection, and an inlet to which is attached a connecting piece, said at least two conduits being attached to said connecting piece and communicating with said inlet;
said multiple valve creating a first flow path between said inlet and said inlet/outlet and a second flow path between said inlet/outlet and said outlet,
a dosing syringe secured to said inlet/outlet connection for a predetermined suction of each of the substrates on a separate basis through said first flow path in a suction stroke of the syringe and for delivery to said outlet through said second flow path of the determined suction of the substrates in a delivery stroke of the syringe;
a flexible mixing container; and
said flexible mixing container; communicating with said outlet; and receiving said separately delivered substrates for mixing;
wherein said system is closed.

4,433,975

CATIONIC FLUORESCENT WHITENING AGENTS

Hans R. Meyer, Binningen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

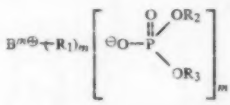
Division of Ser. No. 200,738, Oct. 27, 1980, Pat. No. 4,384,121. This application Sep. 22, 1982, Ser. No. 421,202

Claims priority, application Switzerland, Nov. 1, 1979, 9808/79

Int. Cl.³ C07D *405/04, 413/02*

U.S. Cl. 8—648 7 Claims

1. A process of whitening organic material, comprising the step of incorporating in said material or applying to said material a cationic fluorescent whitening agent of the formula



wherein

B is a fluorescent whitening agent selected from the group consisting of 2-furanylbenzimidazoles, 2-azolylbenzimidazoles, 2-stilbenylbenzimidazoles and 2,5-(benzimidazolyl)furanes,

m is the number of basic amino groups, and each of R_1, R_2 and R_3 is alkyl of 1 to 4 carbon atoms which is unsubstituted or substituted by a non-chromophoric group, or is alkenyl of 2 to 4 carbon atoms which is unsubstituted or substituted by a non-chromophoric group.

4,433,976

PROCESS FOR THE SEMICONTINUOUS DYEING OF TUBULAR KNITTED FABRICS OF CELLULOSE FIBERS WITH AZO DEVELOPING DYESTUFFS

Hans-Ulrich von der Eltz, Frankfurt am Main; Peter Heinisch, Kelkheim, and Hans J. Ballmann, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Hoechst AG, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 288,016, Jul. 29, 1981, abandoned. This application Jan. 24, 1982, Ser. No. 391,858

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1980, 3028843

Int. Cl.³ D06P *1/12, 3/68*

U.S. Cl. 8—555 8 Claims

1. In a process for the even dyeing of a tubular knitted fabric in hose form and consisting of or containing preponderantly cellulose fibers, with at least one water-insoluble azo dyestuff produced on the fiber according to a semicontinuous method, in which the impregnation is performed by applying onto the hose fabric a coupling component under alkaline conditions using the exhaust technique, and the tubular article so treated is then only partially dehydrated and subsequently the development on the dyestuff is effected, wet-on-wet, by slop-padding the textile goods with a developing liquor containing diazo component in the presence of an acid and/or an acid-forming substance, the improvement which comprises incorporating into the acidic developing liquor containing the diazo component capable of being coupled, a combination of a polymeric component selected from the group consisting of homopolymers and copolymers of acrylic acid amide and mixtures thereof, said polymeric component being incorporated in an amount of from 15 to 60 g/l in the form of a 2 to 8% by weight aqueous formulation, and of 2 to 20 g/l of an anionic or non-ionic wetting agent.

4,433,977

SITU PROCESS FOR MAKING MULTIFUNCTIONAL FUEL ADDITIVES

Robert C. Carrier, Austin, and Billy R. Allen, Bridge City, both of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Sep. 21, 1981, Ser. No. 303,735

Int. Cl.³ C10L *1/22*

U.S. Cl. 44—60 10 Claims

1. An in situ process for making a multifunctional fuel additive comprising reacting from 4.0 to 4.5 moles of at least one N-primary alkylalkylene diamine with one mole of maleic anhydride in a mineral oil reaction diluent at a temperature ranging from ambient to 225° F. and recovering a product containing a primary aliphatic hydrocarbon amino alkylene substituted asparagine; excess N-primary alkylalkylene diamine and said diluent, said product having a by-product succinimides content not in excess of 1.0 weight percent based on weight of asparagine present.

4,433,978

FLUIDIZED BED GASIFICATION ASH REDUCTION AND REMOVAL SYSTEM

Carl E. Schenone, Madison, and Joseph Rosinski, Vanderbilt, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 21, 1982, Ser. No. 342,024

Int. Cl.³ C10J *3/72*

U.S. Cl. 48—76 24 Claims

1. A fluidized bed gasification system comprising:

a fluidized bed gasifier for gasifying organic material;

a crusher apparatus disposed below said gasifier;

a container disposed below said crusher apparatus for conducting waste material from said gasifier;

detection means for detecting the level of said waste material in said container; and

control means responsive to said detection means for controlling the operation of said crusher apparatus.

4,433,979

ABRASION RESISTANT SILICON NITRIDE BASED ARTICLES

Vinod K. Sarin, Lexington, Mass.; Robert A. Penty, Cape Elizabeth, Me., and Sergej-Tomislav Buljan, Acton, Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

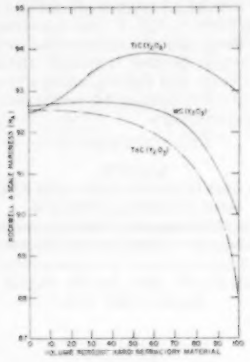
Continuation of Ser. No. 128,070, Mar. 7, 1980, abandoned. This application Mar. 1, 1982, Ser. No. 353,311

Int. Cl.³ C04B *31/16*

U.S. Cl. 51—307 26 Claims

1. A densified composite ceramic article consisting essentially of particles of hard refractory material uniformly distributed in a two phase matrix, said two phase matrix consisting essentially of a first phase and a second intergranular phase,

said particles of hard refractory material being present in an amount from about 1 to about 60 volume percent of said densified composite ceramic article, said particles of hard refractory material selected from the group consisting of the carbides, nitrides, and mixtures thereof of titanium, vanadium, chromium, zirconium, niobium, molybdenum, hafnium, tantalum, tungsten, and combinations thereof, said particles having an average size of less than about 20 microns, said first phase consisting essentially of crystalline silicon nitride, said second



intergranular phase consisting essentially of silicon nitride and a densification aid, said densification aid selected from the group consisting of yttrium oxide, hafnium oxide, the lanthanide rare earth oxides, and mixtures thereof, wherein said densification aid comprises from about 1 to about 25 weight percent of said two phase matrix, said densified composite ceramic article having a high density, a high abrasion resistance, a high hardness, a high fracture strength and a resistance to oxidation at temperatures greater than 1200° C.

4,433,980

METHOD OF POLISHING SILICA BASE CERAMICS

Barry G. Koepke, Mound, and Kelly D. McHenry, Eden Prairie, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Sep. 30, 1982, Ser. No. 431,501

Int. Cl.³ B24D *3/02*

U.S. Cl. 51—308 **4 Claims**

1. A method of polishing silica based ceramics comprising the step of polishing a silica based ceramic with a strontium carbonate polishing agent.

4,433,981

CO_2 REMOVAL FROM GASEOUS STREAMS

Lynn H. Slaugh, and Carl L. Willis, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 235,409, Feb. 18, 1981, abandoned, which is a continuation-in-part of Ser. No. 86,012, Oct. 17, 1979, abandoned. This application Jun. 26, 1981, Ser. No. 277,513

Int. Cl.³ B01D *53/04*

U.S. Cl. 55—59 **8 Claims**

1. A process for removing carbon dioxide from a gaseous stream which comprises contacting said stream at a temperature up to about 300° C. with an adsorbent prepared by impregnating a porous alumina with a sodium or potassium oxide or salt decomposable to the oxide and calcining the impregnated alumina at a temperature ranging from about 350° C. to about 850° C.

4,433,982

INPUT HEAD OF A MEASURING OR IDENTIFICATION SYSTEM FOR CHEMICAL AGENTS

Bernhard Odernheimer; Johannes H. Kremer, and Klaus O. Kranich, all of Munster, Fed. Rep. of Germany, assignors to Bruker-Franzen Analytik GmbH, Bremen, Fed. Rep. of Germany

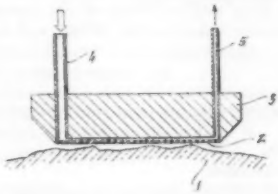
PCT No. PCT/DE81/00043, § 371 Date Nov. 5, 1981, § 102(e) Date Nov. 5, 1981, PCT Pub. No. WO81/02632, PCT Pub. Date Sep. 17, 1981

PCT Filed Mar. 10, 1981, Ser. No. 320,959

Claims priority, application Fed. Rep. of Germany, Mar. 10, 1980, 3009069

Int. Cl.³ B01D *53/22*

U.S. Cl. 55—158 **22 Claims**



1. An input head for a system for actively detecting the presence of chemical agents, said input head comprising:

a thin membrane adapted to be brought into direct contact with a solid surface containing chemical agents, said membrane being formed from a mechanically stable material which when brought into contact with said solid surface causes said chemical agents to be detected to selectively dissolve and to diffuse through said membrane and exit therefrom in a vaporized state,

said membrane including a chemically inert fabric which adequately withstands thermal stresses and mechanical stresses resulting from direct contact with the solid surface, said fabric being thinly and uniformly coated without gaps with a polymerizable paste,

means for directly heating said thin membrane,

means for supplying a carrier gas proximate to the portion of said thin membrane through which said chemical agents exit in said vaporized state for transporting said vaporized chemical agents diffusing through said thin membrane, and

a sample line in fluid communication with said carrier gas for receiving said carrier gas and said vaporized chemical agents being transported therewith.

4,433,983

CALCIUM CHLORIDE DEHYDRATION NOZZLE

Robert A. Hodgson, and Sam J. Martinez, both of Tulsa, Okla., assignors to Maloney-Crawford Corporation, Tulsa, Okla.

Continuation of Ser. No. 194,410, Oct. 6, 1980, abandoned. This application Jul. 14, 1982, Ser. No. 398,231

Int. Cl.³ B01D *53/28*

U.S. Cl. 55—171 **5 Claims**

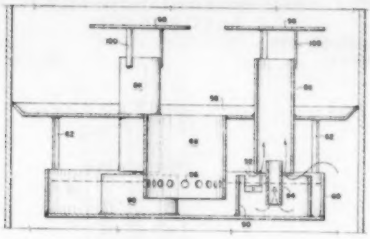
1. An apparatus for separating liquid and associated liquid vapor from a gas stream which is supplied variably at relatively low or high flow rates, comprising a housing with lower, intermediate and upper portions, means to introduce said liquid laden gas into said lower portion, means to withdraw substantially dry gas from said upper portion, means to supply a down flowing liquid dessicant, means to withdraw said dessicant and any fluid separated from said gas from the lower portion of said housing, the intermediate portion comprising:

an upper tray across the interior cross-section of said housing and a lower tray connected thereto in parallel with said upper tray and of a diameter less than the interior of said housing;

means connected to said upper tray enabling liquid dessicant to traverse from said upper to said lower tray;

means in said lower tray to maintain a first liquid level therein;

at least one mixing housing extending from above said first liquid level in said lower tray to slightly above said upper tray including a diverting means connected to an upper portion of said mixing housing to intersect and divert gas and brine as an aid in the separation of liquid from said gas;



a base housing coaxial with and of a larger diameter than said mixing housing, said base housing extending from said lower tray to slightly below a lower end of said mixing housing;

means to meter said liquid from said first liquid level into said base housing;

a conduit means coaxial with and of a smaller diameter than said mixing housing, one end of said conduit means extending at least partially into said mixing housing, the other end positioned above the bottom of said lower tray.

4,433,984

LOW RESIDENCE TIME SOLID-GAS SEPARATION DEVICE AND SYSTEM

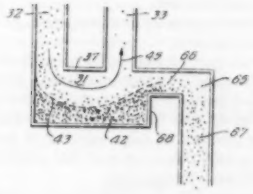
Robert J. Gartside, Auburndale, Mass., and Herman N. Woebcke, Stamford, Conn., assignors to Stone & Webster Engineering Corp., Boston, Mass.

Division of Ser. No. 55,148, Jul. 6, 1979, Pat. No. 4,288,235. This application Sep. 4, 1981, Ser. No. 299,587

The portion of the term of this patent subsequent to Nov. 10, 1998, has been disclaimed.

Int. Cl.³ B01D *45/06, 50/00*

U.S. Cl. 55—196 **1 Claim**



1. A solids-gas separation system to separate a dilute mixed phase stream of gas and particulate solids into an essentially solids free gas stream, the separation system comprising:

a chamber for rapidly disengaging about 80% of the particulate solids from the incoming dilute mixed phase stream, said chamber having approximately rectilinear or slightly arcuate longitudinal side walls to form a flow path of height H and width W approximately rectangular in cross section, said chamber also having a mixed phase inlet of inside width D_i, a gas outlet, and a solids outlet, said inlet being at one end of the chamber disposed normal to the flow path whose height H is equal to at least D_i or 4 inches, whichever is greater, and whose width W is no less than 0.75 D_i but no more than 1.25 D_i, said solids outlet being at the opposite end of the chamber and aligned for downflow of discharged solids by gravity, said solids outlet including a first section which is collinear with the flow path and a second section normal to said first section and aligned for downflow of solids by gravity, said first section further being stepped away from a wall of the chamber opposite the mixed phase inlet, and said gas outlet being disposed intermediate said mixed phase inlet and said solids outlet at a distance no greater than 4 D_i from the inlet as measured between respective centerlines and oriented to effect a 180° change in direction of the gas whereby resultant centrifugal forces direct the solid particles in the incoming stream toward said wall of the chamber opposite to the inlet forming thereat and maintaining an essentially static bed of solids, the surface of the bed defining a curvilinear path extending through a generally circular arc of approximately 90° for the outflow of solids to the solids outlet,

a secondary solids-gas separator, said secondary separator removing essentially all of the residual solids,

a first conduit connecting the gas outlet from the chamber to the secondary separator,

a vessel connected to said solids outlet to receive the discharge of solids, said vessel stripping residual gas from the solids using an inert gas,

a second conduit connecting said vessel and the solids outlet, and,

pressure balance means to maintain a height of solids in said second conduit to provide a positive seal between the chamber and the vessel.

4,433,985

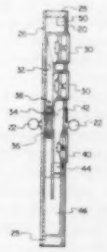
AIR SCRUBBING AND PURIFYING SYSTEM

Terrill A. McGee, 525 S. Ardmore St., Los Angeles, Calif. 90020

Filed Dec. 21, 1981, Ser. No. 332,521

Int. Cl.³ B01D *47/12, 50/00;* **A62C** *35/34*

U.S. Cl. 55—217 **12 Claims**



1. An air scrubbing and purifying system for treating atmospheric air disposed within an enclosed space and contaminated with hazardous products to effect removal of such products from said air, comprising:

air treatment means comprising (a) at least one washing station which includes a liquid medium for washing said contaminated atmospheric air passing therethrough, and (b) at least one purifying station which includes an activated solid medium for the removal of hazardous products from said contaminated atmospheric air passing therethrough;

air moving means comprising (a) electrically actuated intake means for impelling contaminated atmospheric air into and through said air treatment means and (b) electrically actuated discharge means for returning treated air to said enclosed space;

a source of energy connected to said air moving means for energizing said air moving means;

and detector means operably interconnected with said air moving means for sensing hazardous products in contaminated atmospheric air in said enclosed space;

whereby said detector means, upon sensing hazardous products in said contaminated atmospheric air in said enclosed space, actuates said air moving means resulting in said contaminated atmospheric air being passed through said at least one washing and said at least one purifying stations and returing to the enclosed space in uncontaminated form that is suitable for human respiration.

4,433,986

PNEUMATIC DUCT EXTRACTION

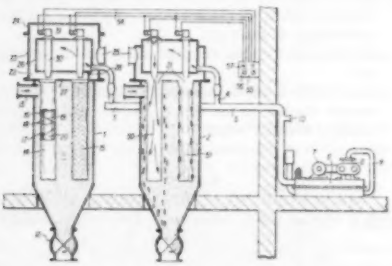
Williband Borst, Uzwil, Switzerland, assignor to Gebraeder Buehler AG, Uzwil, Switzerland

Continuation of Ser. No. 181,856, Aug. 27, 1980, abandoned, Division of Ser. No. 923,145, Jul. 10, 1978, Pat. No. 4,247,310. This application Jan. 15, 1982, Ser. No. 339,629

Claims priority, application Switzerland, Jul. 15, 1977, 8786/77

Int. Cl.³ B01D *46/00*

U.S. Cl. 55—272 6 Claims



1. Low pressure dust extraction apparatus comprising a dusty-air chamber having an inlet, a discharge-air chamber having an outlet, a cleaning-air tank for storage of compressed gaseous medium for cleaning an apertured partition supporting a plurality of bag-like fabric filter elements each having an open end, a corresponding plurality of unrestricted free apertures defined by said open ends of said filter elements and the apertures in said partition for the passage of filtered gaseous medium from said dusty-air chamber by way of said filter elements to said discharge-air chamber, means for causing flow of said gaseous medium such that filtered gaseous medium flows out of said discharge-air chamber and dust-laden gaseous medium flows into said dusty-air chamber, a corresponding plurality of controllable cleaning gaseous medium valves communicating with the clean air tank, said valves having delivery means including stationary driving nozzles directed for flow of cleaning gaseous medium by way of said free apertures into said filter elements in a direction the reverse of that of said filtered gas and extending into said discharge-air chamber to the region of said free apertures, said driving nozzles communicating and extending vertically downwards from said cleaning air tank aligned with said apertures and opening a short distance above said apertures, said discharge-air chamber being situated directly above said dusty-air chamber, and said cleaning-air tank being situated above said dusty-air chamber in the close vicinity thereof but vertically spaced thereabove and within said discharge air chamber, the vertical dimension of siad cleaning-air tank being at least twice the vertical distance between said cleaning air tank and said free apertures wherein the volume of air of said cleaning air tank is at least equal to the volume of said filter elements, control means for governing the duration of opening of said valves, and said valves being connected to said cleaning-air tank so that the required quantity of cleaning gaseous medium at a predetermined pressure can flow directly from said tank by way of said delivery means into said filter elements with varying outflow intensity including a shock phase of high intensity but of short duration immediately followed by a rinsing phase of reduced but sustained intensity and of longer duration.

4,433,987

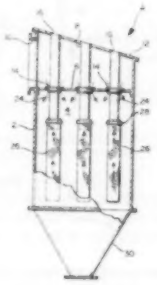
AIR FILTRATION DEVICE

Arthur Lenox, 1390 Valley Rd., Stirling, N.J. 07980

Filed Nov. 20, 1981, Ser. No. 323,380

Int. Cl.³ B01D *50/00*

U.S. Cl. 55—319 28 Claims



23. Apparatus for filtering air laden with dust or other particulate matter including:

(a) a filtering area;

(b) an air velocity dissipation zone above said filtering area;

(c) a lower tube sheet mounted above said dissipation zone and forming a partial boundary therewith;

(d) an air plenum mounted above said lower tube sheet;

(e) said air plenum including an air inlet for receiving dust laden air;

(f) an upper tube sheet forming an upper boundary of said air plenum;

(g) said lower tube sheet including a plurality of holes;

(h) said upper tube sheet including a plurality of holes vertically aligned with said holes in said lower tube sheet;

(i) a plurality of clean air outlet tubes having upper end, main body and lower end portions;

(j) said upper end portions being mounted within said holes in said upper tube sheet;

(k) said main body portions extending through said holes in said lower tube sheet;

(l) said lower end portions extending beneath said lower tube sheet and ending in a horizontal plane at the interface between said dissipation zone and said filtering area;

(m) a plurality of dust bags vertically positioned on said lower end portions of said outlet tubes and extending upwardly to said dissipation zone and positioned substantially within said filtering area;

(n) means for attaching said dust bags to said lower end portions of said clean air outlet tubes;

(o) a plurality of openings in said lower tube sheet for directing air flow from said plenum downwardly below said lower tube sheet; and

(p) diverting means associated with said openings for diverting substantially the entire downward air flow outwardly in a generally horizontal path below said lower tube sheet and against said lower end portion of said outlet tubes; and

(q) said lower end portions of said outlet tubes extending a substantial distance below said diverting means so that substantially the entire air flow passing outwardly from said diverting means will strike said lower end portions of adjacent outlet tubes above their respective dust bags and

thereby prevent high velocity air from impinging upon said dust bags to reduce damage thereto.

4,433,988

HELMET ADAPTED FOR USE BY HAY FEVER SUFFERERS

Richard H. Hinchliffe, 55 Bridge St., Pershore, Worcestershire, England

Filed Jul. 30, 1982, Ser. No. 403,320

Claims priority, application United Kingdom, Aug. 7, 1981, 8124182

Int. Cl.³ B01D *50/00*

U.S. Cl. 55—357 **6 Claims**

1. In combination a helmet adapted for use by a hay fever sufferer and portable filter means remote from said helmet constructed and arranged to be carried by the helmet wearer and to supply filtered air to the interior of said helmet for the wearer to breath, said helmet comprising support means and a hollow globe mounted on said support means formed by two substantially transparent hemispherical sections joined together equatorially of said globe and having an opening at the bottom for entry of the wearer's head into said globe, said globe being adapted substantially to enclose the head and face of the wearer and said support means being adapted to seat on the wearer's shoulders thereby to support said globe from the wearer's shoulders and leaving the wearer free to move his head inside said globe, and said portable filter means comprising a housing, having an air entry, means on said housing whereby said housing can be carried by the helmet wearer, an air supply duct extending from said housing to said globe, and accommodated in said housing at least one filter, an electrically powered motor and a fan driven by said motor which operates to draw air from the atmosphere into said housing through said air entry and cause the air to pass by way of said air supply duct to said globe, said filter being positioned for the air to pass through it before passing into said air supply duct and being adapted to remove pollen, dust and like airbourne matter from the air.

4,433,989

AIR SEPARATION WITH MEDIUM PRESSURE ENRICHMENT

Donald C. Erickson, 1704 S. Harbor La., Annapolis, Md. 21401

Filed Sep. 13, 1982, Ser. No. 416,980

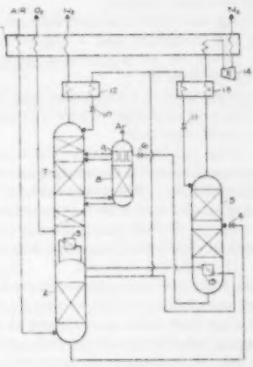
Int. Cl.³ F25J *3/04*

U.S. Cl. 62—13 **7 Claims**

1. In a process for the subambient distillative separation of a mixture of noncondensable gases comprising distilling the feed mixture at a single supply pressure in at least one refluxed high pressure (HP) distillation column to a nearly pure overhead liquid and an enriched liquid containing the bottom product; further distilling at least one enriched fluid containing the bottom product in a reboiled low pressure (LP) column to nearly pure fluid bottom product and nearly pure gaseous overhead product including directly injecting at least part of said nearly pure overhead liquid into said LP column as reflux; and causing HP column reflux and LP column reboil by indirect heat exchange between the two columns, the improvement comprising:

(A) distilling a single supply pressure feed mixture in the HP column;

(b) providing a medium pressure (MP) distillation column operating at a pressure intermediate to said high and low pressures;



(c) distilling in the MP column essentially all the enriched liquid containing the bottom product produced by the HP column to a relatively pure gaseous overhead product at medium pressure and a further enriched fluid containing bottom product;

(d) refluxing the MP column by directly injecting part of said overhead liquid into the upper portion thereof;

(e) reboiling the MP column by indirect heat exchange with the HP column;

(f) routing the further enriched fluid obtained in step (b) into the LP column;

(g) recovering a bottom product from the LP column of up to 99.5% purity.

4,433,990

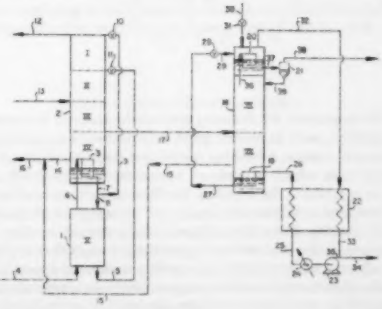
PROCESS TO RECOVER ARGON FROM OXYGEN-ONLY AIR SEPARATION PLANT

Walter J. Olszewski, Tonawanda, N.Y., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Dec. 8, 1981, Ser. No. 328,631

Int. Cl.³ F25J *3/02*

U.S. Cl. 62—22 **13 Claims**



1. In an existing process for producing oxygen by the separa-

tion of air wherein feed air is introduced to an oxygen production facility comprising a high pressure column in heat exchange relation with a low pressure column wherein vapor and liquid flow countercurrently and contact to effect the separation, the improvement comprising retrofitting said existing process to include argon recovery capability including the steps of:

(A) withdrawing from the low pressure column a stream having a flow rate of from about 3 to 9 percent of that of the feed air, said stream comprising from about 10 to 18 percent argon, at most about 0.5 percent nitrogen and the remainder primarily oxygen;

(B) introducing said stream as feed into an argon column having a top condenser and a bottom condenser and which is driven by an independent heat pump circuit comprising the steps of:

(1) introducing cooled, compressed heat pump fluid as vapor to a heat exchanger where it is cooled to a high pressure cold condition,

(2) introducing said high pressure cold vapor to said bottom condenser where it is condensed to a liquid,

(3) expanding the liquid heat pump fluid and introducing it to the top condenser where it is vaporized, and,

(4) withdrawing the heat pump fluid as vapor from the argon column and introducing it to said heat exchanger of step (1) where it is warmed;

(C) separating said feed in said argon column by rectification into an argon-rich fraction and an oxygen-rich fraction;

(D) withdrawing from said argon column at least a portion of said argon-rich fraction as product crude argon containing at least 96 mole percent argon; and

(E) withdrawing at least a portion of said oxygen-rich fraction as product oxygen having an oxygen concentration of at least 99 mole percent.

4,433,991

APPARATUS FOR THE MANUFACTURING OF FIBERS

Giuseppe Melan, Besana Brianza, Italy; Pierre Verdet, Aix les Bains, and Christian Besenval, Montmelian, both of France, assignors to Societé Vetrotex Saint-Gobain, Chambéry, France

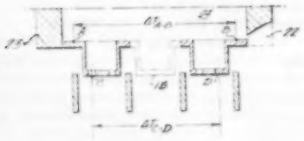
Division of Ser. No. 207,711, Nov. 17, 1980, Pat. No. 4,328,015. This application Jan. 8, 1982, Ser. No. 338,582

Claims priority, application France, Nov. 20, 1979, 79 28539

The portion of the term of this patent subsequent to May 4, 1999, has been disclaimed.

Int. Cl.³ C03B 37/025

U.S. Cl. 65—1 13 Claims



1. The apparatus for drawing attenuable material in attenuable condition, such as molten glass, into filaments comprising a glass supply source, a bushing connected thereto, said bushing having a base which is made of a succession of channels and grooves exposed to the ambient, the base of each channel being perforated with orifices; and means for drawing the attenuable material issuing from the orifices, characterized in that the dimensions of the channels and grooves are such that by thermal exchange with at least one cooling means equipped with elements placed opposite the grooves, drops in temperature of at least 20° C. are created between the level of entry P_E of the molten glass in each channel and the base of the latter, or the fiberization level P_F.

4,433,992

PROCESS AND APPARATUS FOR FORMING MINERAL FIBERS

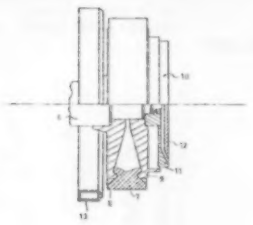
Alain Debouzie, Petite Couronne; Daniel Sainte-Foi, and Yannick Blandin, both of Clermont, all of France, assignors to Isover Saint-Gobain, Paris la Defense, France

Filed Feb. 23, 1982, Ser. No. 351,521

Claims priority, application France, Feb. 24, 1981, 81 03580

Int. Cl.³ C03B 37/05

U.S. Cl. 65—3.1 17 Claims



1. A process for the manufacture of fibers in which the material intended to form the fiber is conducted in the attenuable state onto a centrifuge apparatus comprising several wheels driven in rapid rotation, the material in the form of a voluminous stream being flowed toward the external peripheral surface of a first wheel where it is accelerated and discharged onto a second wheel rotating in the opposite direction of the first, at least a portion of the material adhering to the surface of the said second wheel then being delivered by centrifugal force in the form of fibers, excess material not adhering to the wheel being discharged onto a third wheel rotating in the opposite direction of the second, the peripheral speed of said wheels being between 60–150 m/s, the fibers delivered from the various successive wheels being projected into a rapid gas current transverse to their trajectory, said gas current having a speed sufficient to complete the attenuation of the said fibers and carry them toward a receiving element, and in which a liquid composition for the treatment of the fibers is projected by centrifugation, transversely to the gas current carrying the fibers, in the immediate vicinity of the wheels, under conditions such that drops of the liquid composition of a size sufficient to penetrate the gas current are formed, the speed of the gas current being between 50 and 180 m/s in a region adjoining the periphery of the wheels, the ratio of the speed of the gas current to the peripheral speed of said wheels being between 0.8–1.8.

4,433,993

GLASS SHEET SHAPING AND TEMPERING USING MULTIPLE COOLING STATIONS

Robert G. Frank, Murrysville, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed May 5, 1982, Ser. No. 375,064

Int. Cl.³ C03B 23/02

U.S. Cl. 65—104 5 Claims

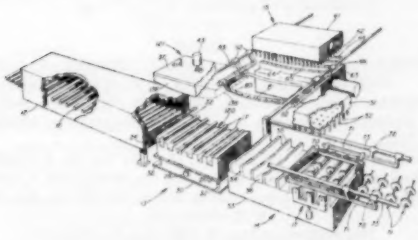
1. An improvement in an apparatus for shaping and tempering glass sheets of the type characterized by an enclosed tunnel-like furnace, a shaping station, an initial glass movement path through said furnace and into said shaping station, a first cooling station along a longitudinal extension parallel to said initial glass movement path, a second cooling station having a glass movement path transverse to said initial glass movement path wherein said first and said second cooling stations include upper and lower plenums each having sets of nozzles extending toward said respective glass movement paths the first cooling station having a first ring-like member for supporting a bent glass sheet between said nozzles and the second cooling having

a second ring-like member for supporting a bent glass sheet between said nozzles, the improvement comprising:

a means beyond said shaping station for supporting said first ring-like member in cantilever fashion for movement along said longitudinal path including tracks extending longitudinally in flanking relation to said first cooling station; and

means entirely to one side of said shaping station for supporting said second ring-like member in cantilever fashion for movement along said transverse path comprising tracks extending transversely of said glass movement path in flanking relation to said second cooling station.

3. A method of shaping and tempering glass sheets to produce tempered sheets of different configurations comprising the steps of:



conveying a first sheet through a hot enclosed atmosphere in an initial glass movement path into a shaping station;

transferring said first sheet by means of a first ring-like member supported in cantilever fashion to a first cooling station situated along a longitudinal path parallel to said initial glass movement path;

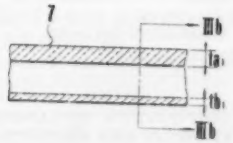
conveying a second sheet through said hot enclosed atmosphere in said initial glass movement path into said shaping station; and

transferring said second sheet by means of a second ring-like member supported in cantilever fashion to a second cooling station situated along a path transverse to said initial glass movement path.

4,433,994
METHOD OF MANUFACTURING CURVED DISCHARGE TUBES

Takashi Fujimura, and Katsuyu Takahashi, both of Mobara, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 17, 1981, Ser. No. 274,512
Claims priority, application Japan, Jun. 29, 1980, 55-118306
Int. Cl.³ C03B *23/06*
U.S. Cl. 65—110 **5 Claims**

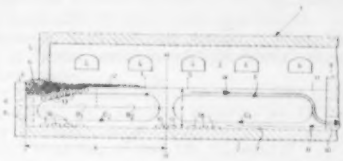


1. A method of manufacturing a curved discharge tube comprising the steps of preparing a straight tube made of transparent material and having an eccentric longitudinal opening, heating the straight tube and bending said tube into a curved tube with a thicker wall portion of the tube on the outside and a thinner wall portion on the inside.

4,433,995
GLASS MANUFACTURE

Francois Toussaint, Montignies-le-Tilleul, Belgium, assignor to Glaverbel, Brussels, Belgium

Filed Feb. 23, 1982, Ser. No. 351,731
Claims priority, application United Kingdom, Feb. 25, 1981, 8105929
Int. Cl.³ C03B *5/027, 5/02*
U.S. Cl. 65—135 **19 Claims**



1. A continuous process of making glass comprising:

feeding a vitrifiable batch to a furnace equipped with heating means for melting the batch so as to produce molten glass, and with at least one cathode and at least one anode between which a direct electric current is established in the molten glass,

the furnace having a melting end into which the batch is fed and having a delivery end remote from the melting end and from which delivery end molten glass is withdrawn, such that there is a net flow of molten glass in the direction which extends from the melting end to the delivery end,

the furnace presenting a melting zone occupied by molten glass and coextensive in height with the molten glass, and in which zone the batch is melted, the melting zone being composed in the vertical direction of an upper half constituting a batch zone and of a lower half, and the melting zone further being composed in the horizontal direction of an upstream half proximate to the melting end and of a downstream half remote from the melting end; and

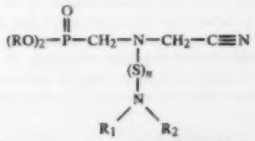
establishing said electric current between at least one cathode located in the upstream half of the batch zone and at least one anode located outside the batch zone.

4,433,996
AMINOSULENAMIDE DERIVATIVES OF N-PHOSPHONOMETHYLGLYCINONITRILES AS HERBICIDES

James A. Sikorski, West Lafayette, Ind., and Mary A. Hoobler, Creve Coeur, Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Oct. 5, 1981, Ser. No. 309,324
Int. Cl.³ A01N *57/22*; C07F *9/40*
U.S. Cl. 71—087 **47 Claims**

1. A method of controlling undesired plants which comprises applying to said plants or plant growth medium a herbicidally effective amount of a compound of the formula

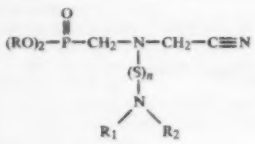


(I)

wherein n is an integer 1 or 2 and wherein R is selected from the group consisting of phenyl, naphthyl, or biphenylyl; or phenyl, naphthyl or biphenylyl substituted with from 1 to 3 substituents independently selected from the group consisting of lower alkyl, lower alkoxy, lower alkylthio, alkoxycarbonyl, methylenedioxy, trifluoromethyl, cyano, nitro and halogen; and wherein R_1 and R_2 are independently selected from the group consisting of hydrogen, cycloalkyl, alkyl, alkyl substi-

tuted with 1 or 2 substituents independently selected from the group consisting of lower alkoxy, lower alkylthio, cyano, lower alkoxycarbonyl, bis(aryloxy)phosphinyl wherein said aryl portion thereof corresponds to a group selected from R, phenyl or phenyl substituted with 1 or 2 substituents independently selected from the group consisting of lower alkyl and lower alkoxy, acyl or aroyl; or R_1 and R_2 are independently selected from the aforerecited groups and joined together to form a cyclic structure having 4–8 atoms therein.

16. A compound of the formula



(I)

wherein n is an integer 1 or 2 and wherein R is selected from the group consisting of phenyl, naphthyl, or biphenylyl; or phenyl, naphthyl or biphenylyl substituted with from 1 to 3 substituents independently selected from the group consisting of lower alkyl, lower alkoxy, lower alkylthio, alkoxycarbonyl, methylenedioxy, trifluoromethyl, cyano, nitro and halogen; and wherein R_1 and R_2 are independently selected from the group consisting of hydrogen, cycloalkyl, alkyl, alkyl substituted with 1 or 2 substituents independently selected from the group consisting of lower alkoxy, lower alkylthio, cyano, lower alkoxycarbonyl, bis(aryloxy)phosphinyl wherein said aryl portion thereof corresponds to a group selected from R; phenyl or phenyl substitued with 1 or 2 substituents independently selected from the group consisting of lower alkyl and lower alkoxy; acyl or aroyl; or R_1 and R_2 are independently selected from the aforerecited groups and joined together to form a cyclic structure having 4–8 atoms therein.

4,433,997

N-ACYLSULFONAMIDE HERBICIDAL ANTIDOTES

Ferenc M. Pallos, Walnut Creek, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

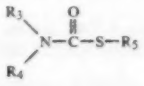
Division of Ser. No. 31,906, Apr. 20, 1979, Pat. No. 4,266,078. This application Nov. 21, 1980, Ser. No. 208,911

Int. Cl.³ A01N *47/24*

U.S. Cl. 71—92 **18 Claims**

1. A composition comprised of:

(a) an herbicidally effective amount of a thiocarbamate herbicide of the formula



in which

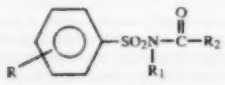
R_3 is selected from the group consisting of 1–6 carbon alkyl and 2–6 carbon alkenyl;

R_4 is selected from the group consisting of 1–6 carbon alkyl, 2–6 carbon alkenyl, cyclohexyl and phenyl; or

R_3 and R_4 taken together form hexamethylene; and

R_5 is selected from the group consisting of 1–6 carbon alkyl, 1–6 carbon haloalkyl, phenyl, and benzyl; and

(b) an antidotally effective amount of an N-acylsulfonamide of the formula



in which

R is selected from the group consisting of hydrogen, methyl, chloro, acetamido, and 1–4 carbon alkoxyamido;

R_1 is selected from the group consisting of hydrogen, allyl, and a metal ion selected from sodium, potassium, lithium, and aluminum;

R_2 is selected from the group consisting of 1–10 carbon alkyl, 1–4 carbon haloalkyl, 2–4 carbon alkenyl, 2–4 carbon haloalkenyl, acetonyl, 1–4 carbon alkoxycarbonyl, 1–4 carbon alkylthioalkyl, alkoxyalkyl, O,O-dialkylphosphorodithioylalkyl, phenyl, halophenyl, halophenylthioalkyl, cyclohexane-1,3-dione-2-yl, and N,N-dimethyl-1,3-biazacyclohexane-2,4,6-tricne-5-yl; or

R_1 and R_2 together with the carbonyl group and nitrogen to which R_1 and R_2 are attached are selected from the group consisting of succinimidoyl, phthalimidoyl, and 4,5-dichlorophthalimidoyl.

4,433,998

PYRIDYLOXY-PHENOXYALKANECARBOXYLIC ACID DERIVATIVES AND THEIR HERBICIDAL USE

Hermann Rempfler, Ettiagen, and Werner Föry, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 140,402, Apr. 14, 1980, Pat. No. 4,329,167, which is a continuation-in-part of Ser. No. 80,965, Oct. 1, 1979, abandoned which is a continuation of Ser. No. 919,119, Jun. 26, 1978, abandoned.

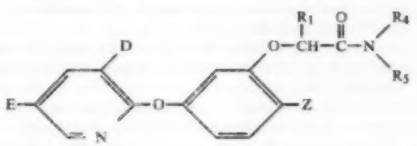
This application Mar. 5, 1982, Ser. No. 355,272

Claims priority, application Switzerland, Jun. 29, 1977, 8023/77

Int. Cl.³ A01N *43/40*; **C07D** *213/64*

U.S. Cl. 71—94 **28 Claims**

1. A compound of the formula:



wherein

E is halo or trifluoromethyl;

D is hydrogen, halo or nitro;

Z is halo or nitro;

R_1 is hydrogen, alkyl of 1 to 4 carbon atoms, or methoxymethyl;

R_4 is hydrogen, alkyl of 1 to 4 carbon atoms, alkenyl of 3 to 8 carbon atoms, alkynyl of 3 to 8 carbon atoms, or alkyl of 1 to 4 carbon atoms substituted with alkoxy of 1 to 4 carbon atoms; and

R_5 is hydrogen, alkoxy of 1 to 4 carbon atoms alkyl of 1 to 4 carbon atoms, alkenyl of 3 to 8 carbon atoms, alkynyl of 3 to 8 carbon atoms, or alkyl of 1 to 4 carbon atoms substituted with alkoxy of 1 to 4 carbon atoms.

28. A method for controlling weeds at a locus, which comprises applying to said locus a herbicidally effective amount of a compound according to claim 1.

4,433,999

HERBICIDE COMPOSITIONS CONTAINING SOIL LIFE EXTENDERS AND ANTIDOTES

Daniel L. Hyzak, Saratoga, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

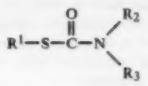
Division of Ser. No. 284,412, Jul. 20, 1981, Pat. No. 4,381,936, which is a division of Ser. No. 96,720, Nov. 21, 1979, Pat. No. 4,299,166. This application Jan. 31, 1983, Ser. No. 462,656

Int. Cl.³ A01N *25/22*, *25/32*

U.S. Cl. 71—100 **9 Claims**

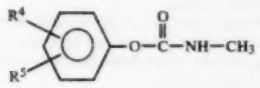
1. An herbicidal composition comprising

(a) an herbicidally effective amount of a thiocarbamate having the formula



in which R^1, R^2, and R^3 are independently C_2–C_4 alkyl; and

(b) an amount of a carbamate having the formula



in which

R^4 and R^5 are each methyl,

R^4 and R^5 conjointly form C_1–C_4 alkylenedioxy,

R^4 is $—CF_3$ and R^5 is hydrogen, or

R^4 is $—CH_2Br$ and R^5 is hydrogen, the amount of said carbamate being sufficient to extend the soil life of said thiocarbamate; and

(c) a non-phytotoxic antidotally effective amount of an antidote selected from the group consisting of N,N-diallyl-2,2-dichloroacetamide, N,N-diallyl-2-chloroacetamide, 2,2,5-trimethyl-N-dichloroacetyl oxazolidine, 2,2-spirocyclohexyl-N-dichloroacetyl oxazolidine, and 1,8-naphthalic anhydride.

4,434,000

N-(BENZENESULFONYL) CARBAMATES HERBICIDAL ANTIDOTES

Martin D. Mahoney, Lansing, Mich.; Edmund J. Gaughan, Berkeley, Calif.; Ferenc M. Pallos, and Hsiao-Ling Lam, both of Walnut Creek, Calif., assignors to Stauffer Chemical Company, Westport, Conn.

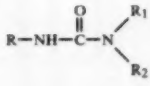
Filed Aug. 24, 1979, Ser. No. 69,486

Int. Cl.³ A01N *43/00, 37/18, 47/30*

U.S. Cl. 71—103 **10 Claims**

1. A composition comprising

(a) an herbicidally effective amount of an urea of the formula



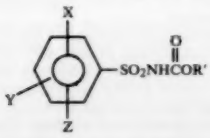
in which

R is selected from the group consisting of phenyl and substituted phenyl, wherein the substitutents are acylamido having from 2 to 10 carbon atoms, inclusive;

R_1 is selected from the group consisting of hydrogen and 1–4 carbon alkyl; and

R_2 is selected from the group consisting of 1–4 carbon alkyl and 1–4 carbon alkoxy; and

(b) a non-phytotoxic but antidotally effective amount of N-(benzenesulfonyl) carbamate of the formula



in which

X and Y are independently selected from the group consisting of hydrogen and methyl;

Z is selected from the group consisting of hydrogen, methyl, chloro, and trifluoromethyl; and

R′ is selected from the group consisting of 1–4 carbon alkyl, 1–4 carbon haloalkyl, 3–6 carbon alkenyl, 3–6 carbon haloalkenyl and 3–6 carbon alkynyl.

4,434,001

METHOD FOR MANUFACTURING METAL FROM FINE-GRAIN METAL-OXIDE MATERIAL

John O. Edström, Stocksund, and Karl G. Görling, Lidingö, both of Sweden, assignors to SKF Steel Engineering AB, Hofors, Sweden

PCT No. PCT/SE81/00321, § 371 Date Jul. 9, 1982, § 102(e) Date Jul. 9, 1982, PCT Pub. No. WO82/01724, PCT Pub. Date May 27, 1982

PCT Filed Nov. 3, 1981, Ser. No. 403,517

Claims priority, application Sweden, Nov. 10, 1980, 8007882

Int. Cl.³ C21B *13/12*

U.S. Cl. 75—3 **17 Claims**

1. A method for manufacturing metal from fine-grain metal-oxide material selected from the group consisting of oxides of iron and oxides of iron in combination with oxides of metals selected from the group consisting of Ni, Co, Cr, Mo, W, Mn and Cu, including a first reduction stage during which the oxide material is reduced at least partially in a fluidized state at a temperature of approximately 1025–1275 K. with a reduction gas selected from carbon monoxide and carbon monoxide in combination with hydrogen, and a following smelting and final-reduction stage for forming a metal melt, there being used for said first reduction stage a reducing gas obtained from said smelting and final-reduction stage, characterized by forming the fine-grain metal-oxide material, prior to said first reduction stage, in the presence of moisture and a binder into cakes or shaped pieces whose size substantially exceeds the maximum size desired for fluidization; permitting said cakes or shaped pieces to harden and then disintegrating and classifying the same to form the starting material for said first reduction stage, said material being given such a particle size distribution that it forms a fluidized bed which is substantially stationary at the considerable gas velocity required for carrying out the reduction process without bogging at the temperature chosen for the first reduction stage.

4,434,002

PROCESS FOR PRODUCTION OF HIGH-PURITY METALLIC IRON

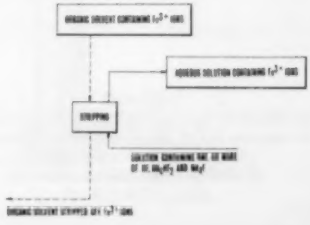
Morio Watanabe, Hyogo, and Sanji Nishimura, Kyoto, both of Japan, assignors to Solex Research Corporation of Japan, Tokyo, Japan

Filed Aug. 20, 1981, Ser. No. 294,538

Claims priority, application Japan, Aug. 29, 1980, 55-119308

Int. Cl.³ C01G *49/00, 49/10*

U.S. Cl. 75—0.5 AA **1 Claim**



1. A process for the production of metallic iron comprising producing ammonium iron fluoride by:

(a) extracting the iron ions from an aqueous solution thereof with an organic solvent containing one or more compounds selected from the group consisting of alkyl phosphoric acid, alkyl or aryl dithio phosphoric acid, carboxylic acid and hydroxime together with a petroleum hydrocarbon as a diluent;

(b) producing ammonium iron fluoride by stripping the resultant organic solvent from the preceding step by contact with an aqueous solutuion containing one or more compounds selected from the group of NH_4HF_2 and NH_4F, and

(c) heating the ammonium iron fluoride in a hydrogen stream to produce metallic iron.

4,434,003

STEEL MAKING METHOD

Ernest S. Geskin, Townhouse #3, Meadow East, Potsdam, N.Y. 13676

Filed Dec. 15, 1980, Ser. No. 216,643
Int. Cl.³ C21B *11/00*
U.S. Cl. 75—24 **19 Claims**

1. A process for producing ferrous metal products from an ore containing iron oxides, said process comprising:

(a) melting fluxing agents and the iron oxide ore together under oxidizing conditions in a melting furnace to form a molten slag, with little reduction of the iron oxide ore;

(b) allowing said molten slag to stratify whereby iron oxide-rich slag collects at the bottom of said melting furnace;

(c) transferring said iron oxide-rich slag from the bottom of said melting furnace to a reduction furnace separate from said melting furnace;

(d) injecting coal and air into said reduction furnace to form carbon monoxide and to establish reducing conditions within said reduction furnace, thereby reducing the iron oxides to form a molten ferrous metal product; and

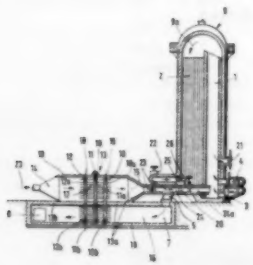
(e) injecting into the molten slag within said reducing furnace, below the surface of the slag, (1) the off-gas from said reduction furnace containing carbon monoxide and (2) air for combustion of said carbon monoxide to form carbon dioxide, thereby establishing said oxidizing conditions within said melting furnace.

4,434,004

METHOD FOR RECOVERY AND RECYCLING OF HEAT FROM HOT GASES IN METALLURIGICAL PROCESSING

Gunter Ratschat, Duisburg, Fed. Rep. of Germany, assignor to Mannesmann Demag AG, Duisburg, Fed. Rep. of Germany

Filed Oct. 23, 1980, Ser. No. 200,002
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1979, 2952216
Int. Cl.³ C21B *9/14*
U.S. Cl. 75—41 **5 Claims**



1. A method for the recovery of retained heat of fully combusted exhaust gases of an air heater and the recycling of said retained heat for use in metallurgical processes, comprising the steps of:

(a) providing a blast furnace and an air heater conventionally connected to said blast furnace;

(b) providing, in communication with said air heater, a capillary action, heat recuperative device comprising at least one tube having two closed ends, said tubes containing a highly volatile substance;

(c) fully combusting fuel gas and preheated air in said air heater to thereby provide fully combusted exhaust gases at a temperature of about 250° C.;

(d) directing said fully combusted exhaust gases of said air heater, at a temperature of about 250° C., past said heat recuperative device;

(e) transferring a portion of the retained heat of said fully combusted exhaust gases to said heat recuperative device;

(f) venting, into the atmosphere, said now-cooler, fully combusted, exhaust gases;

(g) directing fresh gas into heat transferring contact with said heat recuperative device;

(h) transferring a portion of the heat of said heat recuperative device to said fresh gas to thereby preheat said fresh gas; and

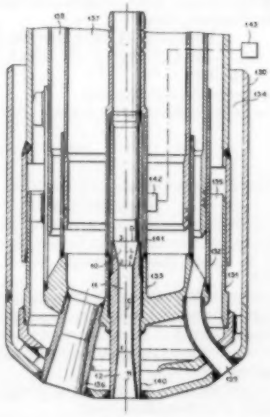
(i) directing said now preheated fresh gas to said air heater for metallurgical processing use therein.

4,434,005

METHOD OF AND APPARATUS FOR REFINING A MELT CONTAINING SOLID COOLING MATERIAL

Paul Metz, Luxembourg; François Schleimer, Esch-sur-Alzette; Ferdinand Goedert, Esch-sur-Alzette; Romain Henrion, Esch-sur-Alzette; Henri Klein, Niedercorn, and Jean-François Liesch, Luxembourg, all of Luxembourg, assignors to Arbed S. A. (Luxembourg), Luxembourg, Luxembourg

Continuation-in-part of Ser. No. 422,844, Sep. 24, 1982, abandoned. This application Nov. 29, 1982, Ser. No. 445,037
Int. Cl.³ C21C *5/32*
U.S. Cl. 75—60 **6 Claims**



1. A method of refining a metal melt in which solid metal tending to cool the melt has been incorporated, comprising the simultaneous steps of:

(a) directing at least one refining oxygen jet from above onto a slag-covered surface of said melt whereby oxygen is introduced into said melt exclusively from above;

(b) directing a jet of neutral gas entraining pulverulent carbon vertically against the surface of said melt in an amount sufficient to provide by exothermic oxidation of the carbon sufficient heat to melt the solid metal and prevent cooling of the melt thereby, said carbon-entraining neutral

gas jet being directed into said melt at a velocity of Mach 1.5 to 2.5; and

(c) injecting neutral gas into said melt through permeable bodies at the bottom thereof in an amount sufficient to prevent foaming of the slag.

4,434,006

FREE CUTTING STEEL CONTAINING CONTROLLED INCLUSIONS AND THE METHOD OF MAKING THE SAME

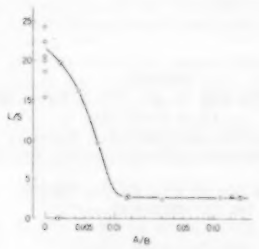
Tetsuo Kato, Nagoya; Shozo Abeyama, Chita; Atsuyoshi Kimura, Handa; Shigenobu Sekiya, and Sadayuki Nakamura, both of Chita, all of Japan, assignors to Daido Tokushuko Kabushiki Kaisha, Nagoya, Japan

Filed May 14, 1980, Ser. No. 149,939

Claims priority, application Japan, May 17, 1979, 54-59712; May 17, 1979, 54-59713

Int. Cl.³ C22C *33/00*

U.S. Cl. 75—123 R 13 Claims



1. A free cutting steel containing controlled inclusions characterized in that the steel contains inclusion A which softens or melts at a temperature below 1000° C. and inclusion B which has a melting point above 1300° C. but exhibits plasticity at a temperature between 900° and 1300° C., the inclusion A and the inclusion B existing in a mutually adhered form, and areal percentage of inclusion A being at least 1% of areal percentage of inclusion B.

10. A free cutting stainless steel containing controlled inclusions characterized in that the steel contains inclusion A which softens or melts at a temperature below 1,000° C. and inclusion B which has a melting point above 1,300° C. but exhibits plasticity at a temperature between 900° and 1,300° C., the inclusion A and the inclusion B existing in a mutually adhered form, and area percentage of inclusion A being at least 1% of area percentage of inclusion B,

said stainless steel having good formability in cold forging characterized in that the steel contains C up to 2.0%, Si up to 2.0%, Mn up to 10%, Cr 10 to 30%, S up to 0.4% and Te up to 0.5%, wherein %Te/%S being at least 0.4, and O being up to 0.015% and the balance being substantially Fe, and at least 80% of the sulfide-based inclusion particles in the steel of a length of 2μ or longer have an aspect ratio not higher than 10.

4,434,007

PROCESS FOR REPRODUCIBLY PREPARING UNIFORM DRY INK COMPOSITIONS COMPRISING WATER-SOLUBLE CATIONIC DYESTUFFS

Ronald S. Lenox, East Hempfield Township, Lancaster County, and Moses Sparks, Jr., Manheim Township, Lancaster County, both of Pa., assignors to Armstrong World Industries, Inc., Lancaster, Pa.

Filed Aug. 4, 1982, Ser. No. 405,261

Int. Cl.³ C09D *11/14*

U.S. Cl. 106—26 20 Claims

1. A process for producing a dry ink composition comprising a cationic dye, said process comprising the steps of

preparing an organic phase comprising a solution of at least one water-soluble cationic dye and a binder in a suitable organic solvent, said organic phase optionally comprising magnetic particles substantially uniformly suspended therein, said solvent having a boiling point lower than that of water or being capable of forming an azeotrope with water, said azeotrope having a boiling point lower than that of water;

intermixing said organic phase with an aqueous solution comprising an ionizable salt, sufficient ionizable salt being present to substantially prevent partition of said dye into said aqueous solution, the temperature of said aqueous solution being not less than said boiling point, said solvent being volatilized during intermixing thereby causing a substantially homogeneous solid mixture comprising said dye, binder and optional magnetic particles to precipitate;

separating and drying said solid mixture; and

pulverizing said solid mixture to obtain a desired particle size range.

4,434,008

SUBSTANTIVE PREPARATION MATERIAL FOR YARNS OR PLIED YARNS

Heinz Dumm; Götz Koerner; Manfred Krakenberg; Hans Rott, and Günter Schmidt, all of Essen, Fed. Rep. of Germany, assignors to Th. Goldschmidt AG, Essen, Fed. Rep. of Germany

Filed Mar. 24, 1982, Ser. No. 361,462

Claims priority, application Fed. Rep. of Germany, Apr. 18, 1981, 3115679

Int. Cl.³ C08L *91/06;* C09D *3/393;* C09G *1/12*

U.S. Cl. 106—271 19 Claims

1. A composition for substantively preparing yarns or plied yarns comprising an oil/water dispersion, the water portion of which contains

(a) from about 5 to 80 weight percent of silicone oil having a viscosity of 500 to 50,000 mm^2/sec at 25° C.,

(b) from about 10 to 80 weight percent of wax with a melting point of not less than about 40° C.,

(c) from about 1 to 10 weight percent of fatty acids having 6 to 22 carbon atoms,

(d) from about 0.4 to 12 weight percent of cationic imidazolinium salts, and

(e) from about 0 to 10 weight percent of ethoxylated fatty amines,

the sum of components (a) to (e) adding up to 100 weight percent.

4,434,009

POLYMER-COATED METALLIC PIGMENTS

Toshiaki Banba, Yamato Koriyama, Japan, assignor to Toyo Aluminium Kabushiki Kaisha, Osaka, Japan

Filed Dec. 3, 1981, Ser. No. 327,203

Int. Cl.³ C09C *1/62*

U.S. Cl. 106—290 15 Claims

1. A metallic pigment for paints comprising metallic pigment particles directly coated with a polymer obtained by polymerizing a monomer having a polymerizable double bond and at least one epoxy radical or a mixture of said monomer and a

comonomer having a polymerizable double bond in the amount of 0.1 to 30 parts by weight in relation to 100 parts by weight of the metallic component in the metallic pigment particles.

4,434,010

ARTICLE AND METHOD FOR FORMING THIN FILM FLAKES AND COATINGS

Gary S. Ash, Santa Rosa, Calif., assignor to Optical Coating Laboratory, Inc., Santa Rosa, Calif.

Division of Ser. No. 108,004, Dec. 28, 1979, abandoned. This application Oct. 26, 1981, Ser. No. 314,695

Int. Cl.³ C09C *1/64*

U.S. Cl. 106—291 **7 Claims**

1. A collection of optical paint flakes adapted to be added to a liquid medium for producing a predetermined optical response to radiation incident on a surface of a solidified version of said medium, said collection of flakes being produced by forming a symmetrical optical multilayer structure on a flexible web of material which is soluble in at least one predetermined liquid, immersing said flexible web of material with said optical multilayer structure thereon in said predetermined liquid to produce a suspension of individual flakes of said optical multilayer structure in the resulting solution, and separating said flakes from said solution, said symmetrical optical multilayer structure comprising a first optical coating structure formed in an inverted manner on said web, an opaque layer of reflecting material formed on said first optical coating structure, and a second optical coating structure formed in a non-inverted manner on said opaque layer and having the same optical coating design as said first optical coating structure, whereby said flakes have the same optical response to incident radiation regardless of which of said first and second optical coating structures is facing said incident radiation.

4,434,011

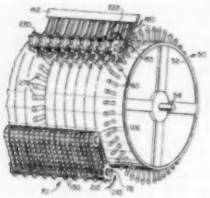
METHOD AND APPARATUS FOR RETRIEVING OBJECTS FROM THE GROUND

Joseph L. Moore, Abilene, Tex., assignor to Proficient Systems, Inc., Abilene, Tex.

Filed Mar. 15, 1982, Ser. No. 358,382

Int. Cl.³ B65F *3/02;* **A01B** *43/00*

U.S. Cl. 134—6 **20 Claims**



1. In a means for retrieving objects from the ground having a ground engageable rotating drum with a plurality of fingers extending therefrom for receiving the objects therebetween, the improvement comprising:

a plurality of discs rotatably mounted on a shaft and driven in conjunction with the rotation of the drum in a direction opposite that of the drum, said toothed discs positioned adjacent said drum and the ground and assisting in the engagement and movement of objects by the drum and fingers to a collection location.

17. In a means for retrieving objects from the ground having a ground engagable rotating drum with a plurality of resilient fingers circumferentially spaced in rows along the drum length and extending radially therefrom, the improvement comprising:

a row of support fingers positioned approximately one quarter of the length of the drum from the ends thereof, said support fingers including a rigid inner core of a length substantially equal to the length of the resilient fingers and having a resilient covering thereon, whereby a substantial portion of the load of the drum may be carried on said support fingers.

18. A method for retrieving objects from the ground comprising:

rotating a ground engagable drum with a plurality of fingers extending therefrom over the ground for receiving objects therebetween;

positioning a plurality of discs rotatably mounted on a shaft adjacent the drum and fingers and driven in conjunction with the rotation of the drum in a direction opposite that of the drum, the plurality of discs being positioned adjacent the drum and ground level during operation of the retrieving means for assisting in the engagement and movement of objects by the drum and fingers thereon to a collection location;

stripping the objects from engagement between the fingers of the drum; and

collecting the stripped objects for later disposable.

4,434,012

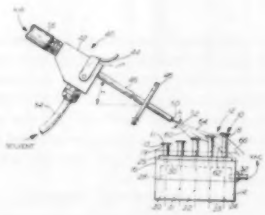
TREATING ARTICLES IN AN ARRAY WITH STREAMS OF A MEDIUM

Robert J. Eckert, Oley, and Frederick R. Keene, Jr., Reading, both of Pa., assignors to Western Electric Co., Inc., New York, N.Y.

Filed Jun. 15, 1982, Ser. No. 388,575

Int. Cl.³ B08B *3/02, 11/02*

U.S. Cl. 134—25.4 **9 Claims**



7. A method of treating surfaces of articles in an array thereof, comprising:

positioning the articles having surfaces to be treated facing upward along a succession of horizontal tiers, a leading tier being at a first elevation and each succeeding tier being parallel to, elevated above and offset horizontally from an immediately preceding tier in stepwise fashion; and

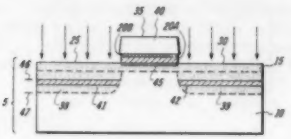
propelling at least one stream of a treating medium upon and at such an angle to the surfaces to be treated that such medium and any dislodged matter is deflected from the respective surfaces without contacting other such surfaces of articles positioned for treatment in the array.

4,434,013

METHOD OF MAKING A SELF-ALIGNED SCHOTTKY METAL SEMI-CONDUCTOR FIELD EFFECT TRANSISTOR WITH BURIED SOURCE AND DRAIN

Izya Bol, Hawthorne, Calif., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 122,627, Feb. 19, 1980, Pat. No. 4,338,616.
This application Mar. 15, 1982, Ser. No. 358,492
Int. Cl.³ H01L *21/265, 7/34*
U.S. Cl. 148—1.5 2 Claims



1. A method of making a high speed, integrated, solid state structure comprising the steps of:

(a) forming along a surface of a substrate of one conductivity type an ion implanted channel layer of the other conductivity type,

(b) annealing said channel layer;

(c) providing a metallic layer over at least a portion of said channel layer,

(d) providing a gate structure of a portion of said metallic layer to define separated source and drain surface area in said ion implanted channel layer,

(e) implanting by high energy ion implantation material of said other conductivity type through said source and drain surface areas to provide heavily doped, buried source and drain areas in said substrate beneath said source and drain surface areas,

(f) laser annealing said buried source and drain areas,

(g) forming by ion implanatation high conductivity areas extending through portions of said surface source and drain areas of said other conductivity type from said substrate surface of said buried source and drain areas, and

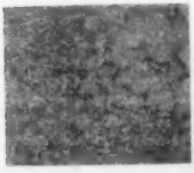
(h) laser annealing said high conductivity areas.

4,434,014

HIGH STRENGTH WEAR RESISTANT ALUMINIUM ALLOYS AND PROCESS

David M. Smith, Hawthorn East, Australia, assignor to Comalco Limited, Victoria, Australia

Filed Sep. 3, 1981, Ser. No. 299,176
Claims priority, application Australia, Sep. 10, 1980, 5505/80
Int. Cl.³ C22F *1/04;* C22C *21/04*
U.S. Cl. 148—3 12 Claims



1. An aluminium-silicon alloy consisting essentially of the following composition by weight:

Si	12–15%
Cu	1.5–5.5%
Ni	1.0–3.0%
Mg	0.1–1.0%

-continued

Fe	0.1–1.0%
Mn	0.1–0.8%
Zr	0.01–0.1%
Silicon modifier	0.001–0.1%
Ti	0.01–0.1%
Al	remainder, apart from impurities,

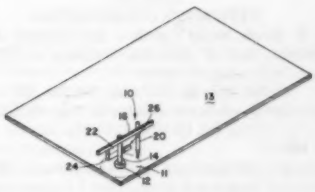
said alloy having an essentially eutectic microstructure containing not more than 10% of primary alpha-aluminium dendrites and being substantially free from intermetallic particles exceeding 10 microns in diameter.

4,434,015

DEVICE AND METHOD FOR CUTTING CIRCULAR PIECE PARTS

Herbert C. Dyson, 2519 Darlean St., Sulphur, La. 70665

Filed Sep. 28, 1982, Ser. No. 425,662
Int. Cl.³ B23K *7/10*
U.S. Cl. 148—9 R 8 Claims



7. A method of cutting circular piece parts from a work piece comprising the steps of:

(a) mounting a shaft at a point corresponding to the center of a piece part;

(b) fixing a cutting means and a means for rotating said cutting means to said shaft;

(c) positioning the cutting means from said shaft relative to the work piece to perform a cutting means from said shaft relative to the work piece to perform a cutting operation;

(d) rotating said cutting means and said means for rotating said cutting means about said point during a cutting operation to develop said circular piece part; and said

(e) fixing step (b) comprises fixing the cutting means from said shaft to cut a circular piece having a diameter of from approximately 5 inches up to approximately 8 feet.

4,434,016

PRECIPITATION HARDENABLE COPPER ALLOY AND PROCESS

Yousef Saleh, West Haven; John F. Breedis, Trumbull, and Jacob Crane, Woodbridge, all of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Feb. 18, 1983, Ser. No. 467,697
Int. Cl.³ C22C *9/01, 9/06;* C22F *1/08*
U.S. Cl. 148—12.7 C 15 Claims

1. A hot workable copper base alloy having improved strss

relaxation resistance when subjected to discontinuous precipitation, said alloy consisting essentially of from about 10% to about 15% by weight nickel, from about 1% to about 3% by weight aluminum, up to about 1% by weight manganese, from about 0.05% to less than about 0.5% by weight magnesium, less than about 0.05% by weight silicon and the balance copper.

7. A process for treating a copper base alloy consisting essentially of from about 10% to about 15% by weight nickel, from about 1% to about 3% by weight aluminum, up to about 1% by weight manganese, from about 0.05% to less than about 0.5% by weight magnesium, less than about 0.05% by weight silicon and the balance copper to provide improved stress relaxation resistance in the presence of a discontinuous type precipitate, said process comprising:

holding said alloy at a temperature of from about 880° C. to about 980° C.;

hot working said alloy;

immediately following said hot working rapidly cooling said alloy;

cold working said alloy up to a 90% reduction in thickness;

solution treating said alloy at a metal temperature near or above the solvus of said alloy;

cold working said alloy up to a 75% reduction in thickness; and aging said alloy at a temperature of from about 400° C. to about 550° C.

4,434,017

EXPLOSIVE COMPOSITION

Lindsay K. Smith, South Caulfield, and Michael A. Yabsley, Cheltenham, both of Australia, assignors to ICI Australia Limited, Melbourne, Australia

Filed Apr. 15, 1981, Ser. No. 254,493

Claims priority, application Australia, Apr. 15, 1980, PE3147

Int. Cl.³ C06B *45/00*

U.S. Cl. 149—2 **21 Claims**

1. A density-stabilized gas-bubble-sensitized melt explosive composition of density not greater than 1.4 g/cc comprising an oxygen releasing salt, a primary fuel material capable of forming an eutectic mixture with the said oxygen releasing salt, a thickening agent, gas bubbles, 0.0 to 3.0 percent by weight of water and 0.05 to 2.0 percent by weight of a surfactant selected from those surfactants which when subjected to a foam stabilization test wherein

(i) 0.5 percent by weight of said surfactant is added to 10 g of a eutectic composition, consisting of 46.7 percent by weight of ammonium nitrate, 43.6 percent by weight of urea and 9.7 percent by weight of sodium nitrate, in a 10 mm diameter tube;

(ii) the mixture is heated to 70° C.; and

(iii) the mixture is shaken for one minute; produces a foam which: after standing for a period of 5 minutes, has a height (f_5) greater than 2 mm; and after standing for a period of 60 minutes, has a ratio (ϕ_5^{60}), of foam height after 60 minutes (f_{60}) to foam height after 5 minutes (f_5), of greater than 0.3.

4,434,018

TIRE RETREADING SYSTEM WITH ENVELOPE PRESSURE

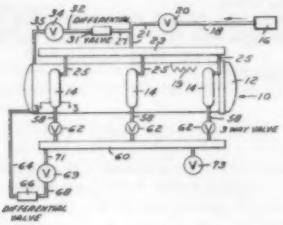
Donaldee Brewer, Muscatine, Iowa, assignor to Bandag, Incorporated, Muscatine, Iowa

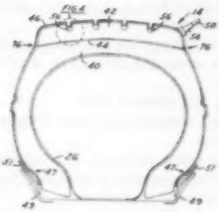
Filed Sep. 21, 1981, Ser. No. 304,523

Int. Cl.³ B29H *5/04, 5/16*

U.S. Cl. 156—96 **12 Claims**

1. In a method of retreading a tire casing which includes the steps of applying a precured rubber tread to the periphery of a tire casing, having side walls, with a layer of vulcanizable rubber-base material interposed between the tread and the tire casing, covering the tread and at least the adjacent side walls of the tire casing with a flexible airtight cover, and applying fluid pressure to the interior of a vessel containing the flexible airtight cover, tread and tire casing in order to press the flexible airtight cover against the assembly of tread and the tire casing, the improvement which comprises supplying fluid pressure from the vessel through a pressure differential check valve to





a cover manifold positioned outside the vessel at a predetermined pressure less than said vessel pressure and supplying fluid pressure to the flexible airtight cover from said cover manifold.

4,434,019

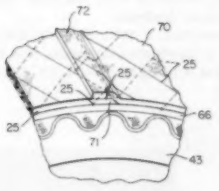
METHOD OF MAKING A POLYMERIC STRIP AND A POWER TRANSMISSION BELT

Gerald C. Hollaway, Jr., Springfield, Mo., assignor to Dayco Corporation, Dayton, Ohio

Filed May 15, 1981, Ser. No. 263,963

Int. Cl.³ B29H *7/22*

U.S. Cl. 156—137 **12 Claims**



1. In a method of making a substantially rectangular strip of material having opposed ends and being adapted for use in a power transmission belt construction, said method comprising the steps of providing a mass of uncured formable polymeric matrix material, mixing a plurality of elongate reinforcing fibers throughout said matrix material, forming said mass to define a strip thereof having opposed surfaces, each surface having a pair of opposed side edges and a pair of opposed end edges, aligning said fibers randomly and substantially uniformly throughout said matrix material with their elongate axes in parallel relation, the improvement comprising the steps of adhering a plurality of parallel spaced apart bleeder yarns against at least one of said surfaces so that each edge of said one surface has a plurality of said bleeder yarns extending thereto, said bleeder yarns enabling said strip to be laminated against

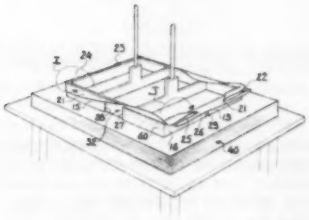
associated layer means comprising said belt construction on a common interface with said bleeder yarns along said interface as well as enabling said strip to have said opposed ends disposed in overlapping relation on a common interface therebetween with certain of said bleeder yarns along said interface of said ends, said bleeder yarns being adapted to serve as fluid passages for any fluid present at said interfaces during curing of said strip and its associated layer means.

4,434,020

METHOD OF MANUFACTURE OF WATERBED LINERS

Wolfgang Blaas, Elk Grove Village; Friedrich Bergl, Chicago both of Ill., and Judson D. Wetmore, Huntington Beach, Calif., assignors to Hold-A-Fold, Inc., Chicago, Ill.

Filed Nov. 1, 1982, Ser. No. 438,177
Int. Cl.³ B32B *1/02, 1/10*
U.S. Cl. 156—216 **5 Claims**



1. A method of manufacture of a seamless waterbed safety liner assembly having a plurality of corners comprising the steps of:

(a) providing a continuous flat sheet of plastic having a floor area delineable therein, margins around said floor area for covering upstanding perimetral walls, and corners in said margins;

(b) providing a form with perimetral side walls and which substantially delineates said floor area;

(c) folding said margin corners of said sheet to provide seamless diagonal triangular hospital corner folds in said margins adjacent said corners;

(d) lapping excess margin plastic into said form;

(e) placing risers adjacent said corners, said risers having an interior face contacting said plastic and an exterior face,

(f) reverse lapping said excess margin plastic over at least a portion of the exterior face of said risers; and

(g) securing said excess margin plastic to the exterior face of said risers, thereby to form corners with said hospital corner fold tips lying on the exterior face of said rigid strips.

4,434,021

REVERSE BUILDING PROCESS FOR THE MANUFACTURE OF COMPLEX-SHAPED VEHICLE FUEL TANKS

Keith D. Robinson, Cedartown, and George P. Smitley, Rome, both of Ga., assignors to Goodyear Aerospace Corporation, Akron, Ohio

Filed Jul. 2, 1982, Ser. No. 394,747
Int. Cl.³ B29C *5/02*
U.S. Cl. 156—242 **9 Claims**

1. A process for the manufacture of a complex-shaped, fabric-reinforced elastomeric fuel tank of the type for installation into a vehicle body cavity comprising the steps of:

providing complementary female mold sections which, when joined together, substantially duplicate the complex geometry of the cavity, said mold sections having means for locating and mounting tank fittings thereon;

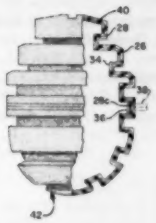
applying a ply of a release material to the surfaces of each mold section;

spray-coating a first ply of a urethane elastomer having 20–70% solids in solution at a rate of 0.1–0.5 gals/min into each mold section;

applying a square-woven 1.5–6.0 oz/sq yd nylon fabric to all areas by first applying fabric patches to the areas of severe complex contour and then applying fabric sheet material to all other areas, cutting the sheet to follow and conform to the contours of the mold;

spray-coating a second ply of urethane elastomer to cover the nylon fabric material;

installing tank fittings on the means provided and securing said fittings in place by suitable pressure applicators;



spray-coating a fuel resistant film over the elastomer to provide barrier to hydrocarbon fuels;

spray-coating a third ply of urethane elastomer onto the barrier film to provide a liner for the tank;

applying an adhesive elastomer to the peripheral edges of the complementary molds;

joining the two mold sections together about their mating peripheral edges and clamping said edges;

applying nylon fabric material and urethane elastomer on the inside of the joined sections at the interface of the peripheral edges to form a splice between the two sections; and

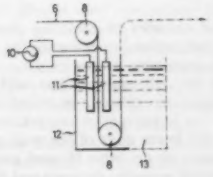
allowing the composite forming the tank to cure into an integral structure.

4,434,022

PROCESS FOR MANUFACTURING COPPER-CLAD LAMINATE

Osao Kamada, Tokyo; Yoshiaki Matsuga, Ibaraki; Masami Watase, Ibaraki; Tadato Kudo, Ibaraki; Hiroyoshi Harada, Ibaraki, and Atsushi Kanezaki, Ibaraki, all of Japan, assignors to Hitachi Cable Limited, Tokyo, Japan

Filed Jul. 8, 1983, Ser. No. 512,047
Claims priority, application Japan, Jul. 8, 1982, 57-119113
Int. Cl.³ C23F *1/00;* **B44C** *1/22;* **B29C** *19/04;* **C03C** *15/00*
U.S. Cl. 156—274.6 **13 Claims**



1. A process for manufacturing a copper-clad laminate which includes a rolled copper foil as a circuit conductive material, comprising the steps of:

preparing a tank filled with an electrolyte in which two parallel electrodes are disposed;

introducing a rolled copper foil through a power supply/-guide roller into said electrolyte so as to pass between said two electrodes under current supply from a power source to said electrodes and said power supply/guide roller to form an etched layer on surfaces of said rolled copper foil;

applying an adhesive on the etched layer of said roller copper foil; and then

pressing said rolled copper foil with a substrate made of a synthetic resin impregnated substrate put together to form a copper-clad laminate.

4,434,023

METHOD FOR PRODUCING PLATE HEATER

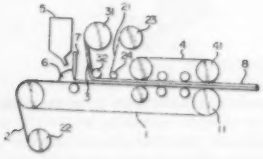
Kozo Kanamori, Kusatsu; Akio Ishimoto, Kashihara; Masaaki Konishi; Hitoshi Maita, both of Uji, and Hiroshi Shimoyama, Urawa, all of Japan, assignors to Sekisui Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Nov. 25, 1981, Ser. No. 324,853

Claims priority, application Japan, Nov. 29, 1980, 55-168660

Int. Cl.³ B32B *31/12, 5/28*

U.S. Cl. 156—307.3 **11 Claims**



1. A method for producing a plate heater, which comprises

preparing a mixture by dispersing electrically conductive fibers in a resin composition comprising a thermosetting resin, a curing agent and a thickener,

laminating the resulting mixture to a first sheet-like material capable of being impregnated with said resin composition to thereby impregnate a part of the resin composition in said first sheet-like material, and thickening the resin composition to form a sheet-like preform,

laminating a second sheet-like material capable of being impregnated with said resin composition to the mixture-laminated surface of the sheet-like preform, and

heating the laminated assembly under pressure to cure the thermosetting resin composition.

4,434,024

DEVICE FOR ASSEMBLING INSULATING GLASS PANES

Peter Lisec, Postfach 21, A-3363 Amstetten-Hausmening (N.Ö.), Austria

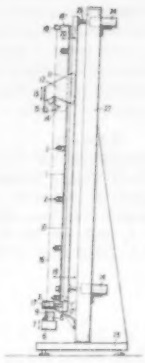
Filed Apr. 5, 1982, Ser. No. 365,266

Claims priority, application Austria, Apr. 3, 1981, 41562/81

Int. Cl.³ B65H *29/20;* **B32B** *31/00*

U.S. Cl. 156—556 **4 Claims**

1. Device for the assembly of insulating glass panes, comprising an upright wall, a plurality of supporting rollers carried by the wall, driven conveying rollers for glass panes adjacent the lower edge of the wall, and a carrier with guide rollers thereon for glass panes movable into or out of the upper zone of the glass pane; the improvement comprising a horizontal beam (6) adjacent the lower edge of the wall, means to raise and lower said beam, lifting cams (8) and guide rollers (9) carried by the beam and engaging between said driven conveying rollers (3); measuring means (16, 17, 18) for detecting the thickness of a glass pane (W_1) with a spacer frame (D) attached thereto, and means responsive to said measuring means for moving said wall backward transverse to the conveying direction and in a direction perpendicular to said wall by a distance equal to said thickness thereby to permit a further glass pane (W_2) to be advanced by said driven conveying rollers into



overlying relationship with the first-mentioned glass pane (W_1).

4,434,025

CONTROLLING CRYSTALLINITY AND THICKNESS OF MONOCRYSTALLINE LAYER BY USE OF AN ELLIPTICALLY POLARIZED BEAM OF LIGHT

Jean J. Robillard, 46 Arnold Rd., Pelham, Mass. 01002

Filed Jun. 4, 1981, Ser. No. 270,242

Int. Cl.³ C30B *23/02*

U.S. Cl. 156—601 **10 Claims**

1. In a process for preparing a thin film semiconductor of one or more monocrystalline layers of a semiconductor material in an evacuated chamber by epitaxial growth by vapor deposition of at least one monocrystalline layer on an epitaxial substrate,the improvement comprising continuously simultaneously controlling the crystallinity and measuring the thickness of each epitaxial monocrystalline layer during the growth thereof by directing an elliptically polarized beam of light at a low angle of incidence over the surface of the epitaxial substrate where the monocrystalline layer is growing, feeding the reflected beam of light to an analyzer to detect any variation in ellipticity of the reflected beam as a function of the crystallinity and film thickness and controlling the vapor deposition in response to any detected variation until the desired crystallinity and thickness is obtained.

4,434,026

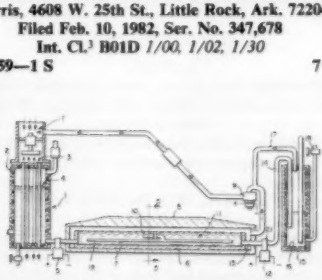
ACID CONCENTRATING AND RECOVERY SYSTEM

Mack Harris, 4608 W. 25th St., Little Rock, Ark. 72204

Filed Feb. 10, 1982, Ser. No. 347,678

Int. Cl.³ B01D *1/00, 1/02, 1/30*

U.S. Cl. 159—1 S **7 Claims**



1. System for concentrating and recovering acid comprising in combination:

a. a receptacle or storage tank for receiving and containing weak or dilute acid;

b. an evaporating pan including a pipe connected to said receptacle or storage tank and a pump whereby acid may be delivered to said evaporating pan;

c. a second receptacle or storage tank including a pipe connected to said evaporating pan and a pump whereby concentrated acid may be delivered to said second receptacle or storage tank; and

d. an air drier device in the form of a tank containing acid and including an inlet through which a mixture of air, acid, and water vapor may be introduced, and a pipe connecting said air drier device to said tank for weak or dilute acid and to a pump operable to deliver weak acid to the weak acid tank;

wherein the concentration of the acid of said mixture is increased in said air drier device by separation and removal of some water vapor from the mixture and said evaporating pan includes a heat collecting surface as a floor thereof and a lens focus top whereby heat energy from the sun's rays will heat and concentrate the acid therein by developing water vapor which is removed with air.

4,434,027

METHOD FOR THE EVAPORATION OF A LIQUID SOLUTION USING MECHANICAL COMPRESSION

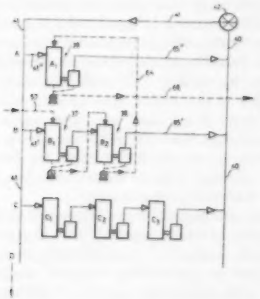
Bastiaan P. Eversdijk, Re Gorredijk, Netherlands, assignor to Stork Friesland B.V., Gorredijk, Netherlands

Continuation of Ser. No. 242,183, Mar. 10, 1981, abandoned. This application Jul. 9, 1982, Ser. No. 396,852

Claims priority, application Netherlands, Mar. 17, 1980, 8001576

Int. Cl.³ B01D *1/26, 1/28*

U.S. Cl. 159—47.1 **2 Claims**



1. The method of evaporating a liquid solution product in an evaporator system to obtain a condensed drier substance therefrom, said system being adapted to deliver treatment vapor at a predetermined temperature and pressure for effecting evaporation and said system having similar multiple stages of similar evaporators with a specified evaporation surface coupled to process the product with the treatment vapor flowing in sequence from previous stages into subsequent stages comprising the steps of, restoring vapor energy consumed in product evaporation in the evaporator system by receiving treatment vapor processed through at least one stage and thereby losing pressure and temperature by mechanically compressing the vapor in a single stage compressor to restore its predetermined temperature and pressure as treatment vapor, serially passing spent vapor from a said previous stage with a high boiling point product into a said subsequent stage having a lowered boiling point product to capture the latent heat of the spent vapor released from the previous stage, thereby to increase the efficiency of obtaining the condensed substance from said product by evaporation, forming a plurality of groups, each group having different numbers of evaporator stages for receiving input treatment vapor and releasing outgoing spent vapor with the evaporator stages in each multiple stage group connected to process the liquid solution product in series from preceding to subsequent stages with input vapor into the groups comprising the mechanically compressed treatment vapor delivered from the compressor in parallel to all the groups and with output spent vapor provided in parallel from the groups to the compressor as the vapor to be mechanically compressed to provide a like total change in input energy from input to output of each group, and passing the product through the similar evaporator stages in a flow path progressing from the group having the greatest number of evaporator stages to the group having the least number of evaporator stages thereby to produce a larger energy change to the product in the evaporator stages receiving the solution in drier form than in previous evaporation stages.

4,434,028

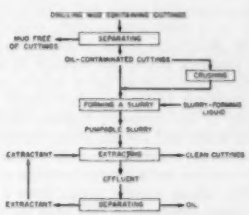
APPARATUS FOR REMOVING ORGANIC CONTAMINANTS FROM INORGANIC-RICH MINERAL SOLIDS

Christopher P. Eppig, Arlington; Bruce M. Putnam, Wayland, and Richard P. de Filippi, Cambridge, all of Mass., assignors to Critical Fluid Systems, Inc., Cambridge, Mass.

Filed Apr. 17, 1981, Ser. No. 255,037

Int. Cl.³ B01D *11/00*

U.S. Cl. 196—14.52 **17 Claims**



1. A system comprising elements arranged, sized and dimensioned for removing organic contaminants including oil from particulate, inorganic-rich mineral solids, including:

(a) pressure vessel means arranged to effect contact between particulate, inorganic-rich, mineral solids containing an organic contaminant and an extractant for said contaminant, which extractant under ambient conditions is a gas and which throughout said contact is maintained under conditions of pressure and temperature to convert it to a fluidic solvent state for said contaminant;

(b) extractant supply means for providing said extractant in said fluidic solvent state;

(c) means, including pressurized fluid supply conduit means and first pressurized fluid withdrawal conduit means, for circulating said extractant in said fluidic solvent state through said pressure vessel means and in contact with said solids so as to form an essentially single-phase primary effluent containing said contaminant;

(d) means, including second pressurized fluid withdrawal conduit means, for removing residual effluent from said pressure vessel means as an essentially single-phase residual effluent; said first and second pressurized fluid withdrawal conduit means terminating in common in a main pressurized fluid conduit means for combining said residual effluent with said primary effluent;

(e) depressurizing means in fluid communication with said main pressurized fluid conduit means for depressurizing the resulting combined, essentially single-phase effluent to form two separable phases comprising a vapor phase containing said extractant and a liquid phase containing said contaminant;

(f) separating means for separating said vapor and liquid phases; and

(g) means for withdrawing the essentially contaminant-free solids from said pressure vessel means for disposal.

4,434,029

PROCESS FOR PRODUCING UNSATURATED NITRILE

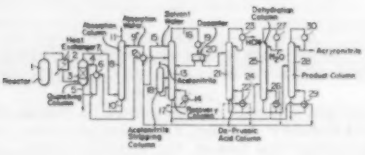
Shigeru Kurihara, Kawasaki, and Hiroyuki Ohashi, Yokohama, both of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Dec. 2, 1981, Ser. No. 326,781

Claims priority, application Japan, Dec. 3, 1980, 55-170493; Jul. 9, 1981, 56-107516

Int. Cl.³ B01D *3/40*

U.S. Cl. 203—42 4 Claims



1. In the production of an unsaturated nitrile by ammoxidizing an olefin to form a reaction mixture containing the unsaturated nitrile, a saturated nitrile and prussic acid, water cooling the mixture in a quenching column, absorbing the reaction mixture with absorption water in an absorption column, subjecting the resulting absorption solution to extractive distillation in a recovery column by using solvent water, taking out a distillate containing the unsaturated nitrile and prussic acid from the top of the recovery column, and then separating prussic acid, water and the like from the distillate by distillation in distillation columns of a de-prussic acid column, a dehydration column and a product column to obtain the unsaturated nitrile, taking solvent water from a side part of the recovery column substantially free from the unsaturated nitrile and prussic acid contained in the feed to the recovery column and recycling it as the absorption water in the absorption column, or withdrawing solvent water from the lower part of the said recovery column and feeding it to the acetonitrile-stripping column to remove substantially all the acetonitrile, and recycling the thus obtained solvent water as the solvent water in the recovery column or as the absorption water in the absorption column or as both such solvent water and absorption water, the improvement which comprises preheating the absorption solution by passing it through at least one column selected from the group consisting of the cooler for the circulating water in the quenching column, the condenser for the overhead vapor in the recovery column, the consenser for the overhead vapor in the dehydration column and the condenser for the overhead vapor in the product column, and the above-mentioned solvent water being used as a heat source for at least one column selected from the group consisting of distillation columns of the de-prussic acid column, the dehydration column, and the product column before preheating said absorption solution with the solvent water.

2. In the production of an unsaturated nitrile by ammoxidizing an olefin to form a reaction mixture containing the unsaturated nitrile, a saturated nitrile and prussic acid, water cooling the mixture in a quenching column, absorbing the reaction mixture with absorption water in an absorption column, subjecting the resulting absorption solution to extractive distillation in a recovery column by using solvent water, taking out a distillate containing the unsaturated nitrile and prussic acid from the top of the recovery column, and then separating prussic acid, water and the like from the distillate by distillation in distillation columns of a de-prussic acid column, a dehydration column and a product column to obtain the unsaturated nitrile, taking solvent water from a side part of the recovery column substantially free from the unsaturated nitrile and prussic acid contained in the feed to the recovery column and recycling it as the absorption water in the absorption column, or withdrawing solvent water from the lower part of the said recovery column and feeding it to the acetonitrile-stripping column to remove substantially all the acetonitrile, and recycling the thus obtained solvent water as the solvent water in the recovery column or as the absorption water in the absorption column or as both such solvent water and absorption water, the improvement which comprises preheating the absorption by passing it through the condenser for the overhead vapor in the recovery column, the above-mentioned solvent water being used as a heat source for at least one column selected from the group consisting of distillation columns of the de-prussic acid column, the dehydration column, and the product column before preheating said absorption solution with the solvent water.

3. In the production of an unsaturated nitrile by ammoxidizing an olefin to form a reaction mixture containing the unsaturated nitrile, a saturated nitrile and prussic acid, water cooling the mixture in a quenching column, absorbing the reaction mixture with absorption water in an absorption column, subjecting the resulting absorption solution to extractive distillation in a recovery column by using solvent water, taking out a distillate containing the unsaturated nitrile and prussic acid from the top of the recovery column, and then separating prussic acid, water and the like from the distillate by distillation in distillation columns of a de-prussic acid column, a dehydration column and a product column to obtain the unsaturated nitrile, taking solvent water from a side part of the recovery column substantially free from the unsaturated nitrile and prussic acid contained in the feed to the recovery column and recycling it as the absorption water in the absorption column, or withdrawing solvent water from the lower part of the said recovery column and feeding it to the acetonitrile-stripping column to remove substantially all the acetonitrile, and recycling the thus obtained solvent water as the solvent water in the recovery column or as the absorption water in the absorption column or as both such solvent water and absorption water, the improvement which comprises preheating the absorption by passing it through the condenser for the overhead vapor in the dehydration column, the above-mentioned solvent water being used as a heat source for at least one column selected from the group consisting of distillation columns of the de-prussic acid column, the dehydration column, and the product column before preheating said absorption solution with the solvent water.

4. In the production of an unsaturated nitrile by ammoxidizing an olefin to form a reaction mixture containing the unsaturated nitrile, a saturated nitrile and prussic acid, water cooling the mixture in a quenching column, absorbing the reaction mixture with absorption water in an absorption column, subjecting the resulting absorption solution to extractive distillation in a recovery column by using solvent water, taking out a distillate containing the unsaturated nitrile and prussic acid from the top of the recovery column, and then separating prussic acid, water and the like from the distallate by distillation in distillation columns of a de-prussic acid column, a dehydration column and a product column to obtain the unsaturated nitrile, taking solvent water from a side part of the recovery column substantially free from the unsaturated nitrile and prussic acid contained in the feed to the recovery column and recycling it as the absorption water in the absorption column, or withdrawing solvent water from the lower part of the said recovery column and feeding it to the acetonitrile-stripping column to remove substantially all the acetonitrile, and recycling the thus obtained solvent water as the solvent water in the recovery column or as the absorption water in the absorption column or as both such solvent water and absorption by passing it through the condenser for the overhead vapor in the product column, the above-mentioned solvent water being used as a heat source for at least one column selected from the group consisting of distillation columns of the de-prussic acid column, the dehydration column, and the product column before preheating said absorption solution with the solvent water.

4,434,030

BATH FOR THE ELECTRODEPOSITION OF BRIGHT NICKEL IRON ALLOY

Stefana D. Vitkova, and Vera V. Mircheva, both of Sofia, Bulgaria, assignors to Institute Po Physikochimia, Sofia, Bulgaria

Filed Nov. 12, 1982, Ser. No. 441,162
Int. Cl.[3] C25D *3/56*
U.S. Cl. 204—43 T 1 Claim

1. Bath for electrodeposition of a bright nickel-iron electrodeposit which comprises nickel sulfate, nickel chloride, ferrous sulfate, boric acid, sodium citrate, sodium gluconate, saccharin and hydroxylated butyne diol characterized in that said bath includes an antipitting agent which is a hydroxyethylated oligoamide with the repeating unit

$$[(CH_2)_n-\underset{\displaystyle CH_2CH_2OH}{\underset{|}{N}}CO(CH_2)_p-\underset{\displaystyle CH_2CH_2OH}{\underset{|}{N}}CO]_m$$

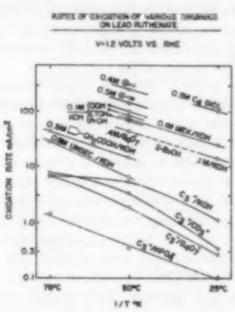
wherein
n=p
n≠p
n and p range from 3–12
m ranges from 4–45
there being two end radicals, in an amount of 0.1–1.5 g/l, said radicals being selected from the group consisting of NH_2 and COOH.

4,434,031

METHOD OF ELECTROCATALYTIC OXIDATION OF ORGANIC COMPOUNDS

Hugh H. Horowitz, Elizabeth; Harold S. Horowitz, Edison, and John M. Longo, New Providence, all of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 176,413, Aug. 8, 1980, abandoned. This application Jul. 15, 1983, Ser. No. 513,820
Int. Cl.[3] C25B *3/02, 11/04*
U.S. Cl. 204—59 R 28 Claims



1. A method of electrocatalytically, partially oxidizing an oxidizable organic compound comprising the step of introducing current by means of an anode into an electrolyte of a cell containing said oxidizable organic compound, said anode comprising an electrocatalyst material having at least one compound of the formula:

$$A_2[B_{2-x}B'_x]O_{7-y}$$

wherein A is selected from any of the pyrochlore structure metal cations in a group consisting of: Pb, Bi, and Tl, wherein B' is selected from any of the pyrochlore structure metal cations in a group consisting of Pb, Bi, Tl, and Sn; wherein B is a pyrochlore structure metal cation at least a major portion of which is selected from a group consisting of at least one of: Ru, Rh, Ir, and Os, wherein Y is equal to or greater than zero and equal to or less than one; and wherein x is equal to or less than one and equal to or greater than zero, said electrolyte of said cell being selected from aqueous solutions, non-aqueous solutions and mixtures of aqueous and non-aqueous solutions and said current being introduced into said electrolyte of said cell at a voltage range between 0.5 and 1.25 volts when said electrolyte is an aqueous solution and between 0.5 and 3.0 volts when said electrolyte is a non-aqueous solution or a mixture of aqueous and non-aqueous solutions, said voltage being relative to the reversible hydrogen potential in the same electrolyte whereby said organic compound is partially oxidized.

4,434,032

PROCESS FOR MAKING SYMMETRICAL ALKANEDIOLS AND THE BIS-ETHERS THEREOF

Maynard M. Baldwin, Columbus, and Robert E. Wyant, Delaware, both of Ohio, assignors to Battelle Development Corporation, Columbus, Ohio

Filed Apr. 25, 1983, Ser. No. 487,978
Int. Cl.[3] C25B *3/10, 3/04*
U.S. Cl. 204—72 26 Claims

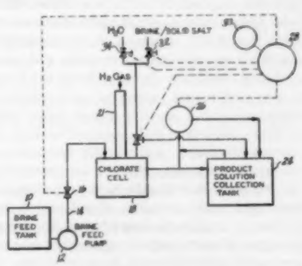
1. A method for making a bis-ether of a symmetrical alkanediol comprising the steps of: electrochemically coupling an ether in an aqueous electrolytic bath having a pH not substantially below 7 and comprising an electrolyte, one moiety of said ether being a haloalkyl group wherein said halogen is bromine or iodine and is separated from the ether oxygen by no more than six carbon atoms and not less then two carbon atoms, the second moiety of said ether being selected from the group consisting of: a C_4–C_{10} alkyl radical having a tertiary carbon adjacent the ether oxygen atom, a 5-membered or a 6-membered oxacyclic ring having a ring carbon adjacent the ether oxygen atom and a ring oxygen atom adjacent said ring carbon atom.

4,434,033

PROCESS FOR PRODUCING CONCENTRATED SOLUTIONS CONTAINING ALKALI METAL CHLORATES AND ALKALI METAL CHLORIDES

Jerry J. Kaczur, Cleveland, Tenn.; Steven A. Iacoviello, West Haven, and Edward G. Miller, Hamden, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed May 27, 1982, Ser. No. 382,524
Int. Cl.[3] C25B *1/26*
U.S. Cl. 204—95 11 Claims



1. A process for producing a concentrated aqueous solution comprised of an alkali metal chlorate and an alkali metal chloride, the process which comprises:

feeding an aqueous alkali metal chloride solution to a first electrolysis zone at an initial feed rate;

electrolyzing the aqueous alkali metal chloride to produce a concentrated chlorate solution comprised of an alkali metal chlorate and the alkali metal chloride;

feeding a portion of said concentrated chlorate solution to an analysis zone;

analyzing said aqueous solution to measure the ratio of the concentration of the chlorate ion to the concentration of the chloride ion;

comparing in a processing zone said measured ratio with a predetermined value range for said ratio, and where said measured ratio falls outside of the predetermined value range for the ratio, altering the initial feed rate of said alkali metal chloride to said first electrolysis zone; and

removing said concentrated alkali metal chlorate solution from said first electrolysis zone to a product solution collection zone.

4,434,034

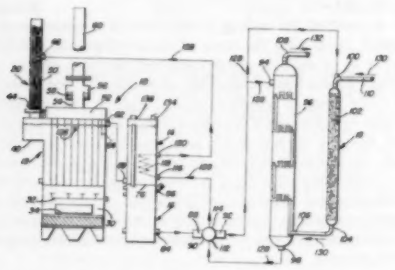
DIRECT FIRED GLYCOL REGENERATOR WITH VERTICAL FLUES

Isaac F. Padilla, Rte. 3, Box 711, Farmington, N. Mex. 87401

Filed Aug. 23, 1982, Ser. No. 411,084

Int. Cl.³ B01D 3/02

U.S. Cl. 202—153 **10 Claims**



1. A direct fired liquid desiccant regenerator designed for fuel efficient operation on low pressure gas fuel comprising elements designed, dimensioned and arranged for regenerating a liquid dessicant, including an upstanding hollow reboiler provided with upstanding peripheral sides, a top and a bottom, a plurality of laterally spaced upstanding tubular flues disposed in said reboiler and opening upwardly and downwardly through said top and bottom, a flue plenum chamber disposed over said top into which said tubular flues open and a flue pipe opening upwardly from said plenum chamber, a combustion chamber disposed below said bottom including low pressure gas burner means therein and into which chamber the lower ends of the tubular flues open, an upper portion of said reboiler including a lateral extension, a still column supported and projecting upwardly from said lateral extension and positioned for regenerated liquid desiccant drainage from the lower end of said column into said lateral extension, said reboiler being adapted for operation with a predetermined liquid desiccant level above and below the lower and upper extremities, respectively, of said lateral extension, said reboiler including a scum baffle protected liquid desiccant outlet in an upstanding side thereof remote from said lateral extension and disposed substantially at said level and extending above and below the latter, a heat exchanger tank including a lower level desiccant inlet and an upper overflow type desiccant outlet, said reboiler outlet being communicated with said heat exchanger inlet, a liquid desiccant storage tank including an inlet communicated with said heat exchanger outlet, said tank including an outlet, a contactor tower, including a liquid desiccant inlet with which said storage tank outlet is communicated and further including an outlet communicated with the inlet of a heat exchange coil in said heat exchanger, said heat exchanger coil including an outlet communicated with an inlet for said column, and pump means for pumping dry desiccant from said tank outlet to said contactor tower inlet and wet desiccant from said tower outlet to said heat exchanger coil inlet.

10. A direct fired reboiler comprising means for attachment to a desiccant regenerator system having elements designed, dimensioned, and arranged for regenerating, a liquid desiccant, said reboiler including upstanding peripheral sides, a top and bottom, a plurality of laterally spaced upstanding tubular flues disposed in said reboiler and opening upwardly and downwardly through said top and bottom, a flue plenum chamber disposed over said top into which said tubular flues open and a flue pipe opening upwardly from said plenum chamber, a combustion chamber disposed below said bottom including low pressure gas burner means therein and into which chamber the lower ends of the tubular flues open, an upper portion of said reboiler including a lateral extension, a still column supported and projecting upwardly from said lateral extension and positioned for regenerated liquid desiccant drainage from the lower end of said column into said lateral extension, said reboiler being adapted for operation with a predetermined liquid desiccant level above and below the lower and upper extremities, respectively, of said lateral extension, said reboiler including a scum baffle protected liquid desiccant outlet in an upstanding side thereof remote from said lateral extension and disposed substantially at said level and extending above and below the latter.

4,434,035

MIXTURES OF AROMATIC-ALIPHATIC KETONES AS PHOTOINITIATORS AND PHOTOPOLYMERIZABLE SYSTEMS CONTAINING THEM

Jürgen Eichler, Weiterstadt; Claus Herz, Heidelberg, and Karl-Heinz Neisius, Darmstadt, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

Division of Ser. No. 243,119, Mar. 12, 1981, Pat. No. 4,390,453. This application Apr. 4, 1983, Ser. No. 481,971

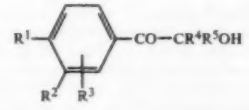
Claims priority, application Fed. Rep. of Germany, Mar. 15, 1980, 3010148

Int. Cl.³ C08F 2/50

U.S. Cl. 204—159.13 **13 Claims**

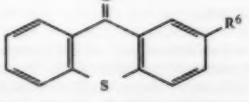
1. A method of photoinitiating a chemical reaction capable of being photoinitiated comprising adding a composition comprising

(A) 0.1 to 99.9 weight % of at least one hydroxyalkylphenone of the formula



wherein R^1 is H, alkyl of 1–4 C atoms or chlorine, R^2 is H or methyl, R^3 is H or methyl, R^4 is alkyl of 1–6 C atoms and R^5 is alkyl of 1–6 C atoms, and

(B) 99.9 to 0.1 weight % of at least one 2-alkylthioxanthone of the formula



wherein R^6 is alkyl of 1–8 C atoms,

as photoinitiator to the reaction system for the chemical reaction.

4,434,036
METHOD AND APPARATUS FOR DOPING SEMICONDUCTOR MATERIAL

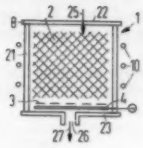
Konstantin Hoerschelmann; Helmold Kausche, both of Munich, and Werner Späth, Holzkirchen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed May 3, 1982, Ser. No. 374,415

Claims priority, application Fed. Rep. of Germany, May 12, 1981, 3118785

Int. Cl.³ H01L *21/22*; H01J *17/00*

U.S. Cl. 204—164 **16 Claims**



1. Method for doping semiconductor material, including a container into which doping material is led and aimed at the semiconductor material by means of an electrical field, which comprises placing a low-pressure plasma containing the doping material in a hydrogen-phosphine mixture in the container, maintaining the low-pressure plasma at a pressure of substantially 8×10^{-4} torr, placing a high-frequency coil around the container, maintaining the frequency of the coil at substantially 4 MHz, and exciting the plasma to lead doping material ions into the semiconductor material by means of the electrical field.

4,434,037
HIGH RATE SPUTTERING SYSTEM AND METHOD

James D. Crank, Redwood City, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Continuation of Ser. No. 283,764, Jul. 16, 1981, abandoned. This application Jul. 11, 1983, Ser. No. 512,799

Int. Cl.³ C23C *15/00*

U.S. Cl. 204—192 R **58 Claims**

1. An apparatus for high rate sputtering a selected target material on a substrate in vacuum, comprising:

(a) a vacuum chamber having an anode, a cathode and means for providing an active plasma therebetween;

(b) said cathode being moveable within said vacuum chamber through said active plasma at a distance from said substrate, said cathode comprising said selected target material; and

(c) means for moving said cathode through said active plasma to have a portion of said cathode arranged within said active plasma while another, contiguous portion of said cathode is arranged outside said active plasma.

4,434,038
SPUTTERING METHOD AND APPARATUS UTILIZING IMPROVED ION SOURCE

Charles F. Morrison, Jr., Boulder, Colo., assignor to Vac-Tec Systems, Inc., Boulder, Colo.

Filed Sep. 15, 1980, Ser. No. 187,140

Int. Cl.³ C23C *15/00*

U.S. Cl. 204—192 R **167 Claims**

1. Sputtering apparatus comprising

at least one element to be sputtered;

at least one plasma source for generating a plasma from at least one ionizable gas where at least some of the charged particles of the plasma sputter the element, said plasma source including

a generator having at least two separate surfaces;

means for generating a magnetic field having lines of force which pass through both of the two cathode surfaces;

a generator anode disposed adjacent that portion of the magnetic field between the two cathode surfaces;

means for establishing an electric field between the generator anode and the generator cathode where at least portions of the electric and magnetic fields are substantially perpendicular to one another

whereby said plasma is formed between the cathode surfaces and ejected away from the generator cathode.

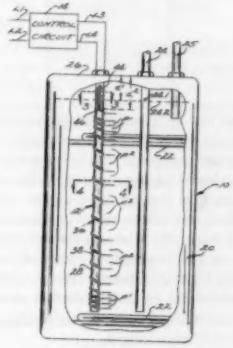
4,434,039
CORROSION PROTECTION SYSTEM FOR HOT WATER TANKS

Robert Baboian, Johnston, R.I., and Gardner S. Haynes, Attleboro, Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 17, 1982, Ser. No. 450,575

Int. Cl.³ C23F *13/00*

U.S. Cl. 204—196 **9 Claims**



1. In a hot water tank comprising, a substantially hollow metal tank having a selected height and an interior surface, the tank being formed at least in part of a corrosively active material, a non-sacrificial anode mounted in the tank and adapted to direct an electrically positive current therefrom to the interior surface when the tank is full of water, an elongated electrically insulative member having first and second end portions, the anode comprising an elongated, electrically conductive member having a portion wound helically about the insulative member from the first to the second end, the helical winding having a smaller pitch adjacent the first and second ends than the pitch intermediate the ends of the insulative member.

4,434,040
VERTICAL-PASS ELECTROTREATING CELL

Edward C. Brendlinger, Pitcairn, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Sep. 28, 1982, Ser. No. 425,762

Int. Cl.³ C25D *17/00, 17/10*

U.S. Cl. 204—206 **5 Claims**

1. In an apparatus for the electrotreating of an extended length of metal strip comprising,

two tube-like elecrolyte corridors for the passage of electrolyte therethrough, said tube-like corridors being supported, with their axes substantially vertical, above an electrolyte tank,

an ingress roll over which the strip passes prior to its downward passage into the upper portion of one of said corridors,

supported in said tank, a sink-roll around which the strip

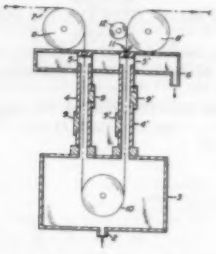
passes prior to its entrance into the lower portion of the second of said corridors,

an egress roll over which the strip passes after its passage from the upper portion of said second corridor,

means for supplying an electrotreating current to said strip,

means for flowing electrolyte into the lower portions of said corridors and overflow means for carrying electrolyte from the upper portions of said corridors back to said electrolyte tank,

the improvement, in which said means for supplying an electrotreating current include electrodes inserted into



holes in the corridor walls and insertable from the outer surface of said walls, the outer wall surface in proximity to such electrodes being free from contact by the electrolyte, said electrodes (i) having an outer flange portion for exerting a liquid-tight sealing force against the corridor wall outer surface and (ii) an inner portion inserted into said wall holes, such that when so inserted (a) the inner electrode face will be in parallel opposition to a strip face and substantially flush with the corridor wall inner surface and (b) the horizontal electrode surface immediate to said inner electrode face is in liquid-tight engagement with the hole surface surrounding it.

4,434,041

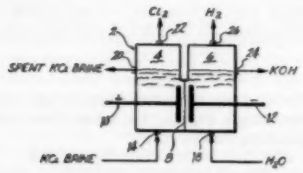
METHOD FOR CONDITIONING CARBOXYLATE/SULFONATE COMPOSITE MEMBRANES FOR PRODUCING KOH

Pilar P. Kelly, Knoxville, and David D. Justice, Cleveland, both of Tenn., assignors to Olin Corporation, New Haven, Conn.

Filed Mar. 1, 1982, Ser. No. 353,123

Int. Cl.³ C25B *13/08*; C25C *7/04*

U.S. Cl. 204—296 **5 Claims**



1. A process for conditioning new membranes used for the production of chlorine gas, hydrogen and potassium hydroxide by the electrolysis of an aqueous solution of potassium chloride in an electrolytic cell having an anode compartment containing an anode and a cathode compartment containing a cathode, said process comprising

(a) separating said anode compartment from said cathode compartment by a membrane comprised of a laminated structure comprising a first fluorinated polymer layer containing sulfonyl groups in ionizable form and a second fluorinated polymer layer containing carboxylic acid functional groups;

(b) introducing said aqueous solution of potassium chloride into said anode compartment;

(c) filling said cathode compartment with a catholyte solution comprised of an aqueous solution of potassium hydroxide having a KOH concentration of up to about 27 percent by weight;

(d) impressing an electrolyzing current between said anode and said cathode to produce chlorine gas in said anode compartment and additional KOH in said catholyte solution;

(e) slowly increasing the concentration of KOH in said catholyte over a conditioning period of at least 12 hours up to a maximum of about 34 percent by weight of KOH after said cell is started up, whereby said membrane is conditioned; and

(f) then operating said cell under normal operating conditions to produce KOH catholyte of the desired concentration.

4,434,042

PLANAR MAGNETRON SPUTTERING APPARATUS

Douglas L. Keith, Santa Clara, Calif., assignor to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Filed Mar. 1, 1982, Ser. No. 353,074

Int. Cl.³ C23C *15/00*

U.S. Cl. 204—298 **6 Claims**

1. A magnetron sputtering apparatus comprising

a base having a top portion, a bottom portion, and an inner chamber,

a support plate including an outer insulative portion for engaging said top portion of said base and an inner electrically conductive portion, said inner electrically conductive portion having a raised pedestal,

a first magnet mounted on said raised pedestal and a second, annular magnet mounted about said raised pedestal,

a magnet housing mounted on said outer insulative portion and encapsulating said first and second magnets, said housing having a top surface in close proximity to said first and second magnets for supporting a target material,

means for supplying a coolant to said inner electrical conductor portion of said support plate within said magnetic housing, and

means for applying a voltage to said inner electrically conductive portion of said support plate.

4,434,043

RECOVERY OF CATALYST FROM COAL LIQUEFACTION RESIDUES

Gopal H. Singhal, Houston, and Ramachandra A. Nadkarni, Baytown, both of Tex., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Jun. 1, 1982, Ser. No. 383,901

Int. Cl.³ C10G *1/06, 1/00*

U.S. Cl. 208—10 **15 Claims**

1. In a process for the liquefaction of carbonaceous solids wherein said solids are contacted under liquefaction conditions in a liquefaction zone with molecular hydrogen in the presence of a catalyst containing metal constituents to produce a liquefaction effluent, and said liquefaction effluent is treated to recover hydrocarbon liquids thereby producing a heavy bottoms containing carbonaceous material, insoluble catalyst residues containing said metal constituents and ash, the improvement which comprises:

(a) reducing the organic content of said heavy bottoms to produce a heavy bottoms deficient in carbonaceous material and containing said insoluble catalyst residues and said ash;

(b) contacting at least a portion of said heavy bottoms deficient in carbonaceous material produced in step (a) with

an aqueous solution of a mineral acid in the presence of an added alcohol and an added oxidizing agent selected from the group consisting of peracids, hydroperoxides and peroxides, thereby extracting said metal constituents from said insoluble catalyst residues into said aqueous solution; and

(c) using the metal constituents extracted in step (b) as constituents of said catalyst.

4,434,044

METHOD FOR RECOVERING SULFUR OXIDES FROM CO-RICH FLUE GAS

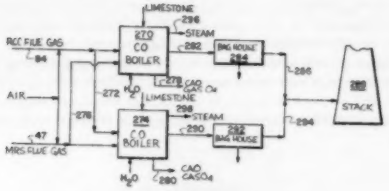
Lloyd E. Busch; Paul W. Walters, and Oliver J. Zandona, all of Ashland, Ky., assignors to Ashland Oil, Inc., Ashland, Ky.

PCT No. PCT/US81/00648, § 371 Date Sep. 1, 1981, § 102(e) Date Sep. 1, 1981, PCT Pub. No. WO82/04062, PCT Pub. Date Nov. 25, 1982

PCT Filed May 13, 1981, Ser. No. 304,992

Int. Cl.³ C10G *25/00*; B01D *53/34*

U.S. Cl. 208—91 **9 Claims**



1. A method for removing sulfur oxides from CO-rich flue gas product of regeneration obtained by burning hydrocarbonaceous deposits of thermal and catalytic conversion which comprises combusting a CO rich flue gas comprising sulfur oxides in a CO boiler zone comprising boiler feed water heat exchange zones dispersed in a fluid bed of limestone particle for removing SO_2 from CO combustion products during indirect heat exchange with the boiler feed water in said heat exchange zones to produce high pressure steam, and separately recovering generated high pressure steam and cooled products of CO combustion separated from sulfur oxides from the CO boiler zone.

4,434,045

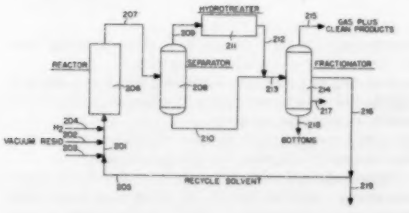
PROCESS FOR CONVERTING PETROLEUM RESIDUALS

Lonnie W. Vernon, Baytown, and Fritz E. Jacobs, Houston, both of Tex., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Jan. 4, 1982, Ser. No. 336,977

Int. Cl.³ C10G *47/00*

U.S. Cl. 208—107 **11 Claims**



1. A process for converting petroleum residuals comprising the steps of:

(a) combining a petroleum residual with a solvent comprising materials selected from the group consisting of paraffinic, aromatic and hydroaromatic materials such that the ratio of paraffinic materials to aromatic and hydroaromatic materials is within the range from about 0:1 to about 0.5:1 and at least 0.8 weight percent donatable hydrogen in a concentration sufficient to provide at least 0.4 weight percent donatable hydrogen based on petroleum residual in the initial mixture;

(b) converting the mixture from step (a) in the presence of molecular hydrogen at a hydrogen partial pressure within the range from about 1500 to about 2500 psig and at a temperature within the range from about 800° to about 850° F. for a nominal holding time within the range from about 30 to about 120 minutes; and

(c) recovering a normally liquid product from the conversion step.

4,434,046

PREVENTING PHASE SEPARATION OF DEWAXED OIL

Costandi A. Audeh, Princeton, and David S. Shihabi, Pennington, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 30, 1981, Ser. No. 259,292

Int. Cl.³ C10G *11/5, 47/16*

U.S. Cl. 208—111 **6 Claims**

1. An improved two-step catalytic process for preparing crude oil for transport, the improvement comprising (1) in a first stage contacting at from about 50 to about 500 psig, a LHSV of from about 0.1 to about 2 and a temperature of from about 500° F. to about 800° F., said crude oil with a crystalline aluminosilicate zeolite having a SiO_2 to Al_2O_3 ratio of at least 12, a constraint index of about 1 to 12, and an alpha value no greater than about one, to substantially dewax said crude oil, the contact being made in the absence or presence of added hydrogen and thereafter cooling said substantially dewaxed crude oil in stages in a temperature of from about 210° F. to about 130° F. and (2) in a second stage filtering said cooled and substantially dewaxed oil thereby separating high melting point hydrocarbons and other organic solids therefrom.

4,434,047

CATALYTIC DEWAXING-HYDROTREATING PROCESS

Albert L. Hensley, Jr., Munster; Thomas D. Nevitt, and A. Martin Tait, both of Naperville, all of Ind., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Nov. 13, 1981, Ser. No. 320,862

Int. Cl.³ C10G *47/16, 47/20*

U.S. Cl. 208—111 **18 Claims**

1. A process for catalytically dewaxing-hydrotreating hydrocarbon feeds comprising contacting the feed with hydrogen under catalytic dewaxing-hydrotreating conditions in the presence of a catalytic composition comprising (1) a hydrogenating component of improved thermal stability comprising a chromium component, at least one other Group VIB metal component and at least one Group VIII metal component deposited on at least a portion of (2) a support comprising a shape selective zeolitic cracking component.

4,434,048

HYDROTREATING CATALYST AND USE THEREOF

Harvey D. Schindler, Fairlawn, N.J., assignor to The Lummus Company, Bloomfield, N.J.

Division of Ser. No. 363,914, Mar. 31, 1982, Pat. No. 4,414,141, which is a continuation of Ser. No. 208,948, Nov. 21, 1980. This application Apr. 4, 1983, Ser. No. 481,776

Claims priority, application Japan, Apr. 30, 1983, 58-63878

Int. Cl.³ C10G *45/08, 47/10*

U.S. Cl. 208—112 **8 Claims**

1. In a process for the hydrotreating of a heavier hydrocarbon containing feedstock having at least 50% thereof boiling above 975° F. in the presence of a hydrotreating catalyst, the improvement comprising:

said hydrotreating catalyst being a catalytically effective

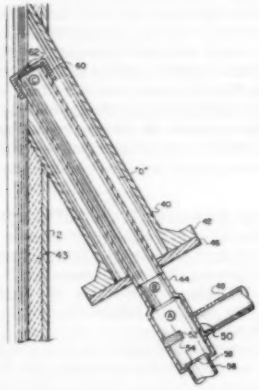
amount of nickel and molybdenum supported on an alumina support, said catalyst having a total porosity of at least 0.5 cc/g and a pore size distribution of from 0.25 to 0.40 cc/g of pores with a diameter of less than 250° A., 0.10 to 0.25 cc/g of pores with a diameter of from 250°-500° A., from 0.20 to 0.30 cc/g of pores with a diameter of from 500°-1500° A., from 0.05 to 0.15 cc/g of pores with a diameter of from 1500°-4000° A., and from 0.03 to 0.10 cc/g of pores with a diameter of greater than 4000° A., said catalyst comprised of nickel and molybdenum supported on alumina having been prepared with calcining at a temperature of from 1150° F. to 1300° F.

4,434,049

RESIDUAL OIL FEED PROCESS FOR FLUID CATALYST CRACKING

Robert R. Dean, #1 Columbine La., Littleton, Colo. 80123; Jean L. Mauleon, 15656 E. Grand Ave., Aurora, Colo. 80015, and Robert J. Newman, 8586 E. Otero Cir., Englewood, Colo. 80112

Filed Mar. 17, 1982, Ser. No. 359,156
Int. Cl.³ C10G *11/18*
U.S. Cl. 208—153 **23 Claims**



1. In a process for effecting the catalytic conversion of hydrocarbons to produce gasoline, lower and higher boiling hydrocarbons and effect regeneration of catalyst particles used therein to provide high temperature catalyst particles, the improvement for obtaining intimate contact between a high boiling hydrocarbon oil stream and catalyst particles recovered at a temperature of at least 1400° F. which comprises,

atomizing said high boiling oil stream with gaseous material in a confined zone external to a riser hydrocarbon conversion zone, passing the atomized oil stream as an oil mist and gaseous material through an elongated confined zone terminating in a restricted diameter opening adjacent the inner surface area of the riser hydrocarbon conversion zone, said restricted diameter opening sized to further atomize said oil mist and provide a preselected spray pattern of high velocity atomized hydrocarbons within said riser zone for intimate contact with upflowing dispersed phase particles of catalyst,

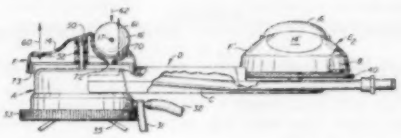
and separating a suspension of product hydrocarbons of cracking and catalyst particles following traverse of said riser zone for separate recovery thereof.

4,434,050

POOL CLEANING DEVICE FOR ROLLING OPERATION UNDER POOL COVER

Walter T. Selsted, Cupertino, Calif., assignor to Arneson Products, Inc., Corte Madera, Calif.

Filed Mar. 25, 1982, Ser. No. 362,008
Int. Cl.³ E04H *3/20*
U.S. Cl. 210—169 **7 Claims**



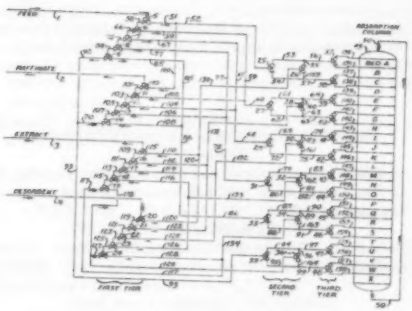
1. In a pool cleaning apparatus having positive buoyancy and propelled motion when positioned in a swimming pool, apparatus for permitting unimpeded motion under a floating pool cover, comprising: at least one inverted caster in overlying arrangement to said pool cleaning apparatus, said caster having a substantially vertical axis for pivotal movement of said caster around said axis at least one of said casters including a ramp to permit said caster to move under obstructions in said cover; and a roller mounted to said caster to permit said pool cleaning apparatus to move under and in contact with said cover.

4,434,051

MULTIPLE VALVE APPARATUS FOR SIMULATED MOVING BED ADSORPTION PROCESSES

Michael W. Golem, Palatine, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Jun. 7, 1982, Ser. No. 385,590
Int. Cl.³ B01D *15/00*
U.S. Cl. 210—264 **26 Claims**



1. An apparatus for performing a fluid-solids simulated moving-bed contacting process which comprises:

(a) a fixed bed of a particulate material which is retained in a fluid-solids contacting zone and which is divided into a number of adjacent sub-beds;

(b) at least two inlet main process stream conduits and at least two outlet main process stream conduits;

(c) a first tier of multi-port valves, with the first tier of valves comprising a separate set of valves for each of the inlet and outlet process stream conduits, the first valve in each set of valves of said first tier having a port in communication with said associated main process stream conduit, each set of valves of the first tier being arranged such that each but the last valve of the set has one port in communication with a hereinafter characterized downstream second tier of multi-port valves and one port in communica-

tion with another valve of the same set, with the last valve of the set having two ports in communication with valves of two different sets of valves of said hereinafter characterized second tier of valves;

(d) a second tier of multi-port valves, with the second tier of valves having a plurality of sets of valves comprising two multi-port valves arranged in parallel such that each valve of the same set has a port in communication with each of at least two conduits leading to a hereinafter characterized third tier of multi-port valves; and,

(e) a third tier of multi-port valves, with each valve of the third tier having at least two ports which are in communication with the flud-solids contacting zones at points between sub-beds of the contacting zone.

4,434,052
CENTRIFUGAL SEPARATOR

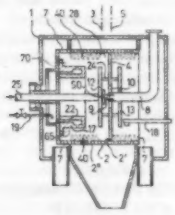
Bruno Mülhaupt, Schlieren, Switzerland, assignor to Escher Wyss Aktiengesellschaft, Zürich, Switzerland

Filed May 17, 1982, Ser. No. 378,833

Claims priority, application Switzerland, Jun. 25, 1981, 4199/81

Int. Cl.³ B01D *33/06*

U.S. Cl. 210—376 **10 Claims**



1. A pusher centrifuge for treatment of a product, especially a suspension comprising:

a housing;

at least one sieve drum having opposed end regions and rotatably mounted in said housing;

a substantially disk-shaped pusher member rotatably arranged within said sieve drum and substantially coaxially positioned with respect to said sieve drum;

said pusher member and said sieve drum being movable to-and-fro relative to one another in the lengthwise direction of the sieve drum between two predetermined deflection points;

said sieve drum having a filter surface at least a portion of which defines a longitudinal section;

said longitudinal section of said sieve drum defines respective sump regions located at opposite sides of said pusher member;

means defining discharge openings for filter cakes formed from the product which is being processed in the centrifugal centrifuge;

said pusher member wipingly contacting said longitudinal section of the filter surface of said sieve drum and serving for the displacement of a filter cake along said sieve drum in the direction towards the discharge openings provided for the filter cakes;

said sieve drum having an imaginary center line;

said deflection points being located to respective sides of said imaginary center line;

a feed pipe for infeeding a suspension constituting the product which is to be separated into the sieve drum;

said feed pipe constitutes a sole feed pipe for infeeding the suspension;

said feed pipe being arranged substantially coaxially with respect to said sieve drum;

said feed pipe having an outflow opening which extends radially outwardly with respect to said feed pipe;

said outflow opening of said feed pipe being located at a central region between both of said deflection points of said pusher member;

said pusher member possessing a substantially central opening defining a free passage through which the feed pipe extends through said pusher member, so that the outflow opening of said feed pipe during the relative to-and-fro displacement of the pusher member and said outflow opening of said feed pipe is alternately located to the one or other side of said pusher member; and

said discharge openings for the filter cakes being located at the region of said opposed end regions of said sieve drum.

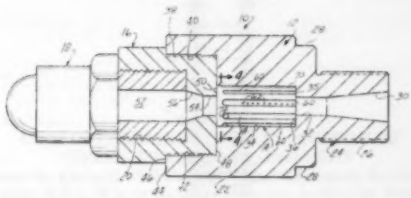
4,434,053
TWO-STAGE FILTER FOR INJECTION MOLDING MACHINE

J. M. Osuna-Diaz, 908 Ravine Ter. Ct., Rochester, Mich. 48067

Filed Jul. 6, 1982, Ser. No. 395,635

Int. Cl.³ B01D *35/02*

U.S. Cl. 210—446 **8 Claims**



1. A filter arrangement for an injection molding machine comprising:

a main body having an internal bore formed therein defining a filter cavity;

a filter screen received within said filter cavity;

said filter screen generally cylindrical to be interfit within said filter cavity and wherein said filter cavity is correspondingly cylindrically shaped; said filter screen being formed with at least one filter groove formed into the periphery of said filter screen and extending axially for a portion of the length of said filter screen, and a discharge groove circumferentially spaced from said at least one filtering groove, said discharge groove formed into the periphery of said filter screen and extending axially along a portion of the length of said filter screen, said at least one filter groove and said at least one discharge groove being separated by an axially extending land, said land being radially spaced to form a circumferentially extending clearance space; inlet passage means including an interior inlet passage extending for a portion of the length of said filter screen;

an outlet passage means including at least one discharge groove;

said inlet passage and outlet passage means each in communication with said at least one filter groove, discharge groove, and circumferentially extending clearance space to define a flow path through said filter with filtration occurring by flow therethrough;

and further including a series of through holes extending between said at least one filter groove and said inlet passage, whereby a two-stage filtering action is enabled by flow through said holes into said filter groove thence through said clearance space into said discharge groove; and

wherein said through holes are of larger diameter than the distance across said at least one clearance space, whereby a coarse filtering action is achieved by flow through said large diameter holes into said filter grooves and a fine

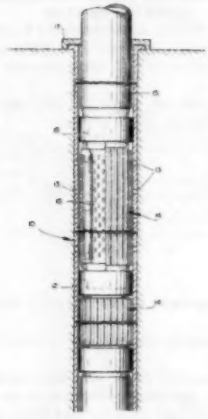
filter action achieved by flow from said filter groove through said clearance space and into said discharge groove.

4,434,054

FILTER FOR SEPARATING DISCRETE SOLID ELEMENTS FROM A FLUID STREAM

Declan B. Livesey, Calgary, and Petre Toma, Edmonton, both of Canada, assignors to Texaco Canada Resources Ltd., Calgary, Canada

Filed Dec. 20, 1982, Ser. No. 451,709
Int. Cl.³ B01D *39/06, 39/20*
U.S. Cl. 210—484 8 Claims



1. A heat resisting filter element for treating a particulate carrying, multi-phase fluid which has been extracted from a subterranean reservoir and which embodies a hot fluid stream into which solid particles of varying sizes from said subterranean reservoir are intermixed, whereby to separate the particulate matter from the hot fluid stream, which filter element includes;

a casing comprising at least two concentrically disposed elongated perforate members which define an annular chamber intermediate adjacent walls thereof, and a central axial flow passage therethrough,

a panel engaging the adjacently disposed common ends of the respective perforate members to define opposed terminal closures to the annular chamber,

port means formed in each respective closure panel being communicated with the said central axial flow passage,

a composite filter bed within said annular chamber and comprised of; a first filter bed section which substantially occupies said annular chamber and is comprised of a mass of randomly disposed fibers which are resistant to thermal deformation, which fibers are sufficiently compressed into said mass to define multitudinous tortuous passages therethrough, and

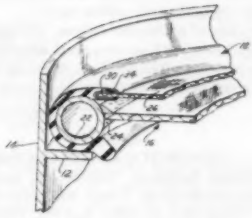
a second filter bed section comprising a perforate sheath formed of a non-corrosive metal and defining openings therein of a sufficient size to prevent flow of the larger of said solid particles, while allowing the flow of smaller solid particles together with hot fluid into said central axial passage.

4,434,055

TWO PIECE SCREEN FILTER

Charles B. Nicholson, Glens Falls, N.Y., assignor to Albany International Corp., Menands, N.Y.

Filed Sep. 3, 1982, Ser. No. 414,807
Int. Cl.³ B01D *25/04, 39/10*
U.S. Cl. 210—489 14 Claims



1. A filter unit comprising:

a first filter including filter media supported by a substantially rigid member about said filter's perimeter;

a second filter including filter media and sleeve means detachably coupled to said rigid member;

said sleeve means being of a resilient material; and

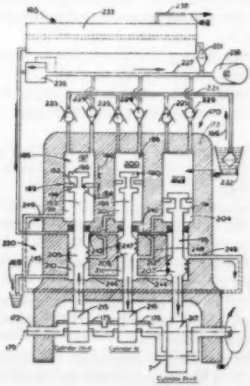
wherein said sleeve means is capable of being stretched into a bearing coupling about a portion of said rigid member so as to detachably maintain said second filter adjacent said first filter in a layered relationship.

4,434,056

MULTI-CYLINDER REVERSE OSMOSIS APPARATUS AND METHOD

Bowie G. Keefer, 4324 W. 11th Ave., Vancouver, B.C., Canada

Continuation-in-part of Ser. No. 27,664, Apr. 6, 1979, Pat. No. 4,288,326, which is a continuation-in-part of Ser. No. 886,429, Mar. 14, 1978, Pat. No. 4,187,173, which is a continuation-in-part of Ser. No. 782,540, Mar. 28, 1977, abandoned. This application Apr. 20, 1981, Ser. No. 255,423
The portion of the term of this patent subsequent to Sep. 8, 1998, has been disclaimed.
Int. Cl.³ B01D *31/00, 13/00*
U.S. Cl. 210—637 25 Claims



19. A method of membrane separation of a feed fluid into permeate fluid and concentrate fluid fractions which respectively are permeated and rejected by selective membrane

means, the membrane means being exposed to pressurized feed fluid supplied by a reciprocating feed pump having at least three feed cylinders in a cooperating set, each cylinder having a displacer means which is reciprocable within the respective feed cylinder, the displacer means dividing the respective cylinder into a pumping chamber in which, during a pumping stroke, feed fluid is pressurized and an expansion chamber in which concentrate fluid is depressurized, each cylinder having a displacer rod for reciprocating the respective displacer means, each cylinder cooperating with valve means in conduit means which communicate with the membrane means, the valve means including an expansion chamber valve means which controls flow relative to the corresponding expansion chamber; the method, which occurs in each cylinder, including the steps of: inducting feed fluid into a particular pumping chamber and simultaneously exhausting concentrate fluid from a corresponding expansion chamber during an induction stroke, followed by pressurizing the feed fluid in the pumping chamber and simultaneously admitting pressurized concentrate fluid into the corresponding expansion chamber to supplement energy supplied to the displacer means during the pumping stroke, the method being further characterized by:

(a) actuating directly with each displacer rod a valve portion of an associated expansion chamber valve means of each cylinder so as to control flow relative to an expansion chamber of a cylinder other than that directly associated with the displacer rod,

(b) actuating the displacer rods of the cylinders so that actuation of the expansion chamber valve means is phased in such a way that when a particular displacer rod of a particular cylinder reaches an end of each stroke thereof, another displacer rod associated directly with the expansion chamber valve means controlling that particular cylinder is approaching a mid stroke position of said other displacer rod, so that the expansion chamber valve means directly associated with said other displacer rod is entering a closed intermediate position thereof during which no fluid passes therethrough,

(c) permitting initial travel of the displacer rod of each cylinder following beginning of each respective displacer rod stroke while the corresponding expansion chamber valve means controlling that particular cylinder is in the closed intermediate position thereof.

4,434,057

WATER PURIFICATION UTILIZING PLURAL SEMIPERMEABLE MEMBRANE STAGES

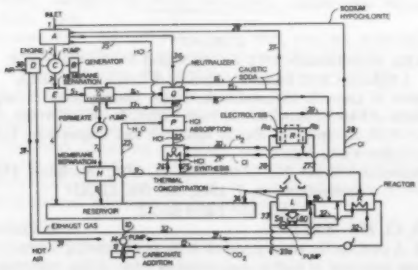
Kurt Marquardt, Holzgerlingen, Fed. Rep. of Germany, assignor to Hager & Elsasser GmbH, Stuttgart, Fed. Rep. of Germany

Filed Feb. 11, 1982, Ser. No. 347,684

Claims priority, application Fed. Rep. of Germany, Feb. 16, 1981, 3105550

Int. Cl.³ B01D *13/00*

U.S. Cl. 210—638 **27 Claims**



1. A water treatment process comprising the steps of:

conditioning inflowing raw water to reduce scale forming materials therein;

pressurizing the conditioned water;

subjecting the pressurized water to a first membrane separation process to produce a permeate and a concentrate;

treating the concentrate from the first membrane separation process to reduce scale forming materials therein;

pressurizing the treated concentrate;

subjecting the pressurized concentrate to a second membrane separation process to produce a permeate and a concentrate;

subjecting the concentrate from the second membrane separation process to a thermal concentration process to produce condensate and carbon dioxide;

mixing the permeate produced in the first and second membrane separation process with the condensate from the thermal concentration process; and

injecting carbon dioxide produced during the thermal concentration process into the said mixture of permeate and condensate to produce a potable water.

4,434,058

COOLING ARRANGEMENT AND METHOD OF OPERATING THE ARRANGEMENT

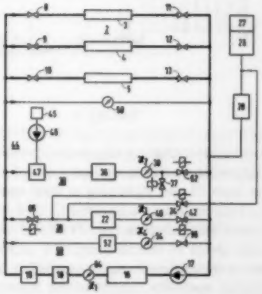
Horst W. Emshoff, Mülheim, and Walter Küsebauch, Erlangen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jul. 17, 1981, Ser. No. 284,497

Claims priority, application Fed. Rep. of Germany, Jul. 18, 1980, 3027322

Int. Cl.³ B01J *47/14*

U.S. Cl. 210—662 **5 Claims**



5. A method for operating a cooling arrangement including a closed cooling system with deionized cooling water having a main loop; a parallel loop with a mixed bed filter; means for feeding an alkalizer; and an anion exchanger adapted to be connected either in series or parallel with the mixed bed filter, comprising, when starting up, conducting a partial stream of the cooling water through the anion exchanger and the mixed bed filter until the electric conductivity in the main loop and the electric conductivity behind the anion exchanger is reduced to a predetermined low value; and then turning the mixed bed filter off and conducting the partial streams exclusively via the anion exchanger, and feeding alkalizer to the cooling water until the pH value is raised to a predetermined value.

4,434,059

POLYMERS FOR PREVENTION OF FOULING BY IRON OXIDES IN COOLING SYSTEMS

Donald A. Johnson, Bolingbrook, and Baker N. Nimry, Downers Grove, both of Ill.

Continuation of Ser. No. 230,787, Feb. 2, 1981, abandoned. This application Nov. 18, 1982, Ser. No. 442,498

Int. Cl.³ C02F 5/12

U.S. Cl. 210—701 4 Claims

1. A method for the stabilization of water containing iron and calcium ions said water being utilized in an industrial process cooling system operating at a pH of from 6–11, which comprises adding to the water containing iron and calcium ions an effective amount of a copolymer of acrylic acid and acrylamide having a molecular weight of approximately 10,000 the ratio of acrylic acid to acrylamide being 25:75 on a weight basis.

4,434,060

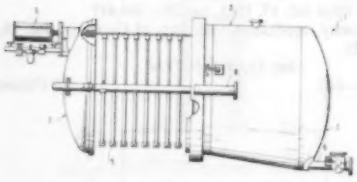
REMOVAL OF HEAVY METALS CONTENT

David C. Altmansberger; Christina L. Huss, and Haans H. Kroger, all of Gainesville, Fla., assignors to General Electric Company, N.Y.

Continuation of Ser. No. 210,194, Nov. 25, 1980, abandoned. This application Jun. 4, 1982, Ser. No. 385,208

Int. Cl.³ C02F 1/52

U.S. Cl. 210—724 13 Claims



1. A process for reducing the heavy metals content of an aqueous composition containing heavy metal having an atomic weight of at least 55 and including at least one metal from the group of nickel, cadmium, and cobalt; alkali metal hydroxide and alkali metal salts wherein the pH of said aqueous composition is at least about 14 which comprises adding a filter aid to said aqueous composition in an amount of at least about 0.1% by weight based upon the weight of the aqueous composition, and adding lime to the composition in an amount of at least about 0.1% by weight and being sufficient to cause precipitation of said heavy metals and then filtering said composition to thereby reduce the heavy metals content and wherein the amounts of said hydroxide and said salts in the composition after filtering are substantially the same as the initial content thereof prior to filtering.

4,434,061

SOLIDS-LIQUID SEPARATION

Curtis S. McDowell, Allentown, Pa., assignor to Cellu-Craft Inc., New Hyde Park, N.Y.

Filed Sep. 10, 1980, Ser. No. 185,899

Int. Cl.³ B04B 5/00

U.S. Cl. 210—787 37 Claims

1. Apparatus for continuously separating solids and liquids in a solids-liquid mixture and continuously removing the separated solids and liquids from the apparatus comprising:

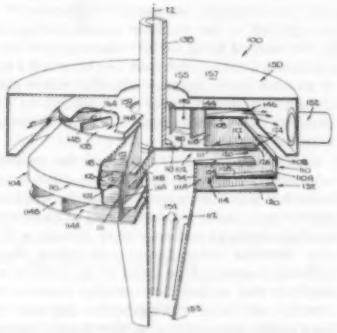
an upstream chamber and a downstream chamber connected in said apparatus for rotation about an axis of rotation;

means for introducing mixture into said upstream chamber, said upstream chamber being structured to cause mixture introduced therein to move outwardly from said means for introducing upon rotation of said upstream chamber;

means for communicating said upstream chamber and said downstream chamber such that mixture moving outwardly in said upstream chamber during rotation thereof can move into said downstream chamber through said means for communicating;

first means for removing mixture from said upstream chamber and discharging it from the apparatus;

means cooperating with said means for communicating and said first means for causing a major part of the mixture in



the upstream chamber to be removed therefrom through said first means and for causing a minor part of the mixture to be removed therefrom to said downstream chamber through said means for communicating;

said first means causing mixture removed from the upstream chamber substantially to reverse direction before being discharged from the apparatus;

second means for removing liquid from said downstream chamber;

said upstream and downstream chambers, said means for communicating and said first means being operative to provide a region of low turbulence to mixture in the downstream chamber relative to turbulence in the upstream chamber during rotation of said chambers such that liquid is separated from mixture in said downstream chamber and moves toward said second means through which the separated liquid is removed from said downstream chamber.

4,434,062

OIL DISPLACEMENT ENHANCED BY LYOTROPIC LIQUID CRYSTALS IN HIGHLY SALINE MEDIA

Alexis A. Oswald, Mountainside; Helen Huang; John Huang, both of East Brunswick, and Paul Valint, Jr., Woodbridge, all of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 47,641, Jun. 11, 1979, abandoned. This application Jan. 2, 1981, Ser. No. 222,137

Int. Cl.³ E21B 43/22

U.S. Cl. 252—8.55 D 26 Claims

1. A process for recovering oil from an oil bearing formation in the presence of highly concentrated brine which comprises displacing oil with a middle phase primary displacement liquid containing lamellar liquid crystals which exhibit decreasing viscosities at increasing shear rates and consist essentially of

(a) 0.5 to 10 vol.% of surfactant or combination of surfactants wherein at least one surfactant component is appropriately ethoxylated to obtain a balanced hydrophilic-lipophilic character, and providing a liquid crystalline middle phase containing oil and brine,
(b) 0.1 to 20 vol.% of an oil, and
(c) brine similar to that found in the formation and containing from about 5 to 30 wt.% of inorganic salts having sodium chloride as the major component and salts of divalent metals as minor components, said middle phase liquid containing lamellar liquid crystals being free from alcohol cosurfactant
driving the liquid through the formation, and recovering the displaced oil.

4,434,063

LUBRICANT COMPOSITIONS

Hachiro Kageyama, Kamakura; Tsutomu Moriuchi, Chigasaki, and Yoshiaki Oikawa, Fujisawa, all of Japan, assignors to Kyodo Yushi Co., Ltd., Tokyo, Japan

Filed Aug. 7, 1981, Ser. No. 291,059
Int. Cl.³ C10L *1/54*
U.S. Cl. 252—25 **6 Claims**

1. A lubricant composition comprising not less than 0.1% by weight of at least one calcium ferrite selected from the group consisting of monocalcium ferrite, dicalcium ferrite and hemicalcium ferrite, which is produced by mixing an iron oxide and a calcium compound in a molar ratio of 1:0.5 to 1:2 and fusing them by heating at a temperature of 1200°–1400° C. and contains not more than 5% by weight in total of ferric oxide, silica and alumina as an impurity in admixture with a mineral oil.

4,434,064

GRAPHITE DISPERSION

Tai S. Chao, Olympia Fields; Aubrey C. Smith, Jr., Harvey, and Frederic D. Smies, Homewood, all of Ill., assignors to Atlantic Richfield Company, Philadelphia, Pa.

Filed May 4, 1981, Ser. No. 260,531
Int. Cl.³ C10M *1/20, 1/32*
U.S. Cl. 252—29 **7 Claims**

1. A method for improving the yield and stability of a graphite-in-oil dispersion comprising: grinding graphite to form graphite particles having an average diameter in the range from about 2 microns to about 15 microns in the presence of an oxygen-containing atmosphere so that said graphite particles have an oxygen content in the range of about 1% to about 7% of total weight of the graphite particle including oxygen, and dispersing at least a portion of said graphite particles into an oil to form a graphite-in-oil dispersion.

4,434,065

NOVEL ALIPHATIC SULFOSILOXANE-SILICATE COPOLYMERS

Pauls Davis, Gibraltar, and Joe C. Wilson, Woodhaven, both of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Division of Ser. No. 249,916, Apr. 1, 1981, Pat. No. 4,354,002. This application Jul. 23, 1982, Ser. No. 401,087
Int. Cl.³ C09K *5/00, 3/00*
U.S. Cl. 252—75 **7 Claims**

1. An improved inhibited aqueous alcohol composition comprising water, an alcohol, and a corrosion inhibiting amount of a copolymer consisting essentially of about 0.1 to about 99.9 parts by weight of at least one group member derived from silicone sulfonates selected from the group consisting of aliphatic silicone sulfonates having the formula:

$$[MO_3SR'_b\,SiO_{\frac{4-a-b}{2}}$$

wherein M is a monovalent, divalent or trivalent cation; R is a divalent aliphatic hydrocarbon radical; R' is an alkyl radical of from 1 to about 8 carbon atoms; a has an average value of from 1 to 3; b has an average value of from 0 to 2 and the total average value of a+b is from 1 to 3; and from 0.1 to 99.9 parts by weight of at least one silicate group derived from a water-soluble silicate represented by the formula:

$$[X_{1/d}O_{\frac{4-e}{2}}SiO_{\frac{4-e}{2}}$$

wherein X is a cation that forms a water-soluble silicate selected from the group consisting of sodium, potassium, lithium, rubidium, and tetraorganoammonium cations; d is the valence of the cation represented by X and has a value of at least 1, and e has a value from 1 to 3 inclusive, said parts by weight of said groups in said copolymer being based upon 100 parts by weight of said copolymer.

4,434,066

WATER-BASED ENERGY TRANSMITTING FLUID COMPOSITIONS

Walter E. F. Lewis, Stamford, Conn., assignor to Union Carbide Corporation, Danbury, Conn.

Continuation-in-part of Ser. No. 221,503, Dec. 30, 1980, abandoned. This application Jan. 25, 1983, Ser. No. 460,872
Int. Cl.³ C10M *3/04, 3/14, 3/26*
U.S. Cl. 252—77 **20 Claims**

1. A water-based energy transmitting fluid having enhanced anti-wear properties which comprises an aqueous composition having a viscosity of at least 10 centistokes at 40° C. which contains up to about 80 percent by weight of water, at least 0.1 percent by weight of a carboxylic acid lubricity agent and a minimally effective amount of an anti-wear additive which comprises the combination of a hydroxyl-substituted aromatic carboxylic acid component and a nitroaromatic compound component.

4,434,067

POWDERED CLEANING COMPOSITION

Thomas J. Malone, LaGrange, Ga., and Mark E. Ragsdale, Spartanburg, S.C., assignors to Milliken Research Corporation, Spartanburg, S.C.

Filed Jul. 27, 1981, Ser. No. 286,801
Int. Cl.³ C09K *3/22;* C11D *3/04, 17/00*
U.S. Cl. 252—88 **5 Claims**

1. A powdered cleaning composition having a soil substantivity constant greater than 1.5 and consisting essentially of:
(a) about 100 parts by weight particulate urea-formaldehyde polymeric material having an average particle size of from about 10 to about 105 microns in diameter, an oil absorption value of no less than 90, fiber hardness, and a bulk density of at least about 0.2 g/cc;
(b) from about 5 to about 400 parts by weight of an inorganic salt adjuvant selected from sulfates, chlorides, carbonates, bicarbonates, borates, citrates, phosphates, nitrates, metasilicates and mixtures thereof, having an average particle size of from about 45 to about 600 microns in diameter; and
(c) from about 5 to about 400 parts by weight of a fluid consisting essentially of 0 to 100 percent water containing sufficient surfactant to give a surface tension of less than about 40 dynes per centimeter and 100 to 0 percent of a high boiling hydrocarbon solvent.

4,434,068
PROCESS FOR MANUFACTURING DETERGENT SPECKLES

Francois Delwel, Dordrecht, and Roland De Goede, Vlaardingen, both of Netherlands, assignors to Lever Brothers Company, New York, N.Y.

Filed Mar. 8, 1982, Ser. No. 355,790

Claims priority, application United Kingdom, Mar. 18, 1981, 8108463

Int. Cl.³ C11D *3/06, 11/02*

U.S. Cl. 252—135 **5 Claims**

1. A process for the production of coloured speckles for use in detergent powders which comprises spraying particulate material with an aqueous solution of colourant characterised in that the solution also comprises a hydratable salt, and the particulate material onto which the solution is sprayed comprises a spray-dried detergent base powder.

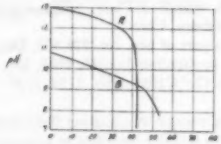
4,434,069
PLASTIC BOTTLE CLEANER

Meredith H. Fairchild, Whittier, Calif., assignor to Purex Corporation, Lakewood, Calif.

Filed Jul. 28, 1982, Ser. No. 402,778

Int. Cl.³ C11D *7/12, 1/66, 3/10*

U.S. Cl. 252—174.14 **18 Claims**



1. The process of cleaning a poly carbonate bottle, that includes

(a) washing the bottle with a composition consisting of an aqueous basic solution containing solute members and relative weight percents consisting of between 84 and 91 weight percent alkali metal carbonate, between 8 and 12 weight percent alkali metal bi-carbonate and about 1 percent low foaming detergent, and

(b) then rinsing the bottle with water,

(c) the solution pH being at or below 11.0.

4,434,070
GRANULATE-FORM POWDER AGGLOMERATES OF PULVERULENT RUBBER CHEMICALS AND A PROCESS FOR PRODUCTION

Wolfgang Lindner, Günter Arend, both of Dormagen; Carl-Dieter Barnikel, Cologne, and Günter Frauenkron, Burscheid, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

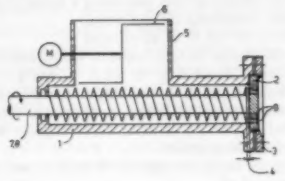
Filed May 12, 1981, Ser. No. 263,028

Claims priority, application Fed. Rep. of Germany, May 20, 1980, 3019232

Int. Cl.³ C08C *4/00*; B29H *1/10*

U.S. Cl. 523—323 **6 Claims**

1. A process for the production of granulate-form agglomerates comprising mixing the pulverulent rubber chemicals of a maximum primary grain size of 500 μm with a moistening agent and/or a lubricant and supplying them to a double shaft screw granulator with forced conveyance, in which the spacing between the nozzle plate and the vertically cut screw ends is between 0,1 and 1.0 mm, whereby the compression ratio K_D is between 1:4,5 and 1:2,5 and the ratio of nozzle channel length to nozzle channel diameter is between 2 and 5, and whereby the specific granulation work is from 2 to 40 Wh/kg, forcing the rubber-chemicals axially through a nozzle perforating plate, severing the issuing strands or allowing them to break-off and are then drying them.



4. A product produced by the process of claim 1.

4,434,071
1,3-DIBROMO DIALKYLHYDANTOIN AND OLEFIN OLIGOMER REACTION PRODUCT AS A CATALYST FOR PREPARING ALKENYL DICARBOXYLIC ACID ANHYDRIDE

Justin C. Powell, Fairfax, Va., assignor to Texaco Inc., White Plains, N.Y.

Filed Jan. 15, 1982, Ser. No. 339,571

Int. Cl.³ C09K *3/00*; C07D *307/60*

U.S. Cl. 252—182 **20 Claims**

1. The method which comprises

maintaining a mixture consisting essentially of a 1,3-dibromo dialkylhydantoin and an olefin oligomer of molecular weight M_n of 250–30,000 at 150° C.–300° C. for 0.1–10 hours thereby forming a reaction mixture; and

recovering said reaction mixture.

16. The method of preparing a product alkenyl aliphatic dicarboxylic acid anhydride which comprises reacting at 150° C.–300° C.

(i) an olefin oligomer reactant of molecular weight M_n of 250–30,000;

(ii) an unsaturated aliphatic dicarboxylic acid anhydride in amount of 0.5–5 moles per mole of olefin oligomer;

and

(iii) as catalyst, 0.5 w %-50 w %, based on said olefin reactant of the reaction product of a 1,3-dibromo dialkylhydantoin and an excess of an olefin oligomer of molecular weight M_n of 250–30,000 thereby forming product alkenyl aliphatic decarboxylic acid anhydride; and

recovering said product alkenyl aliphatic dicarboxylic acid anhydride.

4,434,072
LIQUID CRYSTAL COMPOSITION

Seiichi Imahori; Masaharu Kaneko, both of Kanagawa; Tetsuo Ozawa, Tokyo; Shuji Imazeki, Ibaraki; Akio Mukoh, Ibaraki, and Mikio Sato, Ibaraki, all of Japan, assignors to Mitsubishi Chemical Industries, Ltd. and Hitachi Ltd., both of Tokyo, Japan

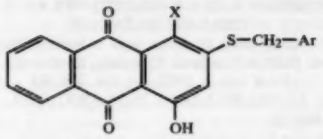
Filed Jan. 18, 1982, Ser. No. 340,547

Claims priority, application Japan, Jan. 17, 1981, 56-5749; Jan. 17, 1981, 56-5750

Int. Cl.³ C09K *3/34*; C02F *1/13*

U.S. Cl. 252—299.1 **6 Claims**

1. In a liquid crystal composition comprising a host liquid crystal and a pleochroic dye dissolved therein as a guest material, the improvement wherein the pleochroic dye contains an anthraquinone-based dye yielding a magenta color or an orange color, said anthraquinone-based dye being represented by the general formula:



wherein X is an amino group or a hydroxyl group, and Ar is an aryl group which may be substituted by an alkyl group, an alkoxyalkyl group, an aryloxyalkyl group, a cycloalkyl group, an alkoxy group, an alkoxyalkoxy group, an arylalkoxy group, an acyloxy group, an alkoxycarbonyl group, an aryloxycarbonyl group, an aryl group, a halogen atom, a cyano group or a nitro group.

4,434,073

PERHYDROPHENANTHRENE DERIVATIVES, THEIR PREPARATION, AND THEIR USE IN LIQUID-CRYSTALLINE DIELECTRICS AND ELECTRO-OPTICAL DISPLAY ELEMENTS

Wolfgang Sucrow, Paderborn; Hans-Rüdiger Murawski, Lampertheim; Hermann Minas, and Horst Stegemeyer, both of Paderborn, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Dec. 8, 1982, Ser. No. 447,822

Claims priority, application Fed. Rep. of Germany, Dec. 8, 1981, 3148448

Int. Cl.[3] **C09K** *3/34;* **G02F** *1/13;* **C07C** *13/60, 23/44, 43/18, 69/013, 121/46*

U.S. Cl. 252—299.62 **15 Claims**

1. A perhydrophenanthrene of the formula

wherein R_1 is alkyl of 1–10 C atoms and R_2 is alkyl, alkoxy or alkanoyloxy each of 1–10 C atoms, H, Br, Cl or CN.

4,434,074

VOLUME REDUCTION AND ENCAPSULATION PROCESS FOR WATER CONTAINING LOW LEVEL RADIOACTIVE WASTE

Daniel W. Fox, Pittsfield, Mass.; George P. Miller, and Marx E. Weech, both of San Jose, Calif., assignors to General Electric Company, San Jose, Calif.

Filed Apr. 2, 1981, Ser. No. 250,439

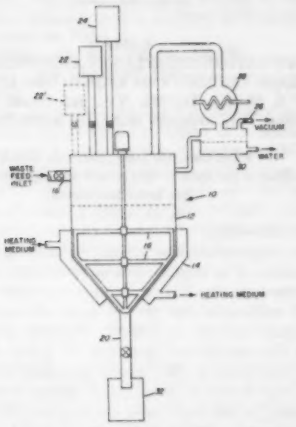
Int. Cl.[3] **C09K** *3/00, 11/04;* **C21C** *19/42*

U.S. Cl. 252—628 **33 Claims**

1. A method of removing water from water-containing waste material and encapsulating the resultant dewatered waste material, consisting essentially of the combination of steps of:

a. combining with water and non-volatile waste material a water insoluble polymerizable organic liquid and forming a low boiling azeotropic mixture of said polymerizable liquid with the water, and heating said azeotropic mixture to evaporate the water and polymerizable organic liquid and thereby dewater the waste material; and

b. polymerizing said polymerizable organic liquid dispersed through the dewatered waste material, and forming a



polymer encapsulation about the dewatered waste material.

4,434,075

ANIONICALLY MODIFIED ORGANOPHILIC CLAYS AND THEIR PREPARATION

Wilbur S. Mardis, Trenton, N.J., and Claude M. Finlayson, Houston, Tex., assignors to NL Industries, Inc., New York, N.Y.

Filed Oct. 19, 1981, Ser. No. 313,033

Int. Cl.[3] **B01J** *13/00*

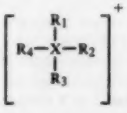
U.S. Cl. 252—315.2 **17 Claims**

1. An organophilic clay gellant comprising the reaction product of:

a. a smectite-type clay having a cation exchange capacity of at least 75 milliequivalents per 100 grams of said clay;

b. an organic anion in an amount ranging from 5 to 100 milliequivalents per 100 grams of said smectite-type clay, 100% active clay basis; and

c. an organic cation having the formula



wherein R_1 is selected from the group consisting of a β,γ-unsaturated alkyl group having less than 7 aliphatic carbon atoms, a hydroxyalkyl group having 2 to 6 aliphatic carbon atoms and mixtures thereof, R_2 is a long chain alkyl group having 12 to 60 carbon atoms, R_3 and R_4 are individually selected from the group consisting of a β,γ-unsaturated alkyl group having less than 7 aliphatic carbon atoms, a hydroxyalkyl group having 2 to 6 carbon atoms, an aralkyl group having 1 to 22 carbon atoms in the alkyl portion, an alkyl group having from 1 to 22 carbon atoms and mixtures thereof and X is selected from the group consisting of phosphorous and nitrogen, said organic cation being present in an amount sufficient to at least satisfy the cation exchange capacity of the smectite-type clay and the cationic activity of the organic anion, wherein the cation exchange sites of the smectite-type clay are substituted with the organic cation and wherein

an organic cation-organic anion complex is intercalated with the clay.

4,434,076

CLAY CATION COMPLEXES AND THEIR USE TO INCREASE VISCOSITY OF LIQUID ORGANIC SYSTEMS

Wilbur S. Mardis, Trenton, N.J., and Claude M. Finlayson, Houston, Tex., assignors to NL Industries, Inc., New York, N.Y.

Filed Oct. 19, 1981, Ser. No. 313,034
The portion of the term of this patent subsequent to Jul. 5, 2000, has been disclaimed.
Int. Cl.³ B01J 13/00
U.S. Cl. 252—315.2 13 Claims

1. An organophilic clay gellant, which comprises: the reaction product of an organic cationic ammonium compound and a smectite-type clay having a cation exchange capacity of at least 75 milliequivalents per 100 grams of said clay, wherein said organic cationic ammonium compound contains

(a) a first member selected from the group consisting of a α,γ-unsaturated alkyl group having 6 or less aliphatic carbon atoms, a hydroxyalkyl group having 2 to 6 aliphatic carbon atoms, and mixtures thereof,

(b) a second member comprising a long chain alkyl group having 12 to 60 carbon atoms and

(c) a third and fourth member selected from a member of group (a), an aralkyl group having 1 to 22 carbon atoms in the alkyl portion, an alkyl group having 1 to 22 carbon atoms and mixtures thereof; and wherein the amount of said organic cationic ammonium compound is from 90 to 140 milliequivalents per 100 grams of said clay, 100% active clay basis.

4,434,077

LIQUEFIED NORMALLY SOLID POLYOXYALKYLENE COPOLYMERS

Thomas M. Kaneko, Trenton, Mich., assignor to BASF Wyandotte Corporation, Wyandotte, Mich.

Continuation-in-part of Ser. No. 200,118, Oct. 24, 1980, Pat. No. 4,351,753. This application Aug. 2, 1982, Ser. No. 404,195
The portion of the term of this patent subsequent to Sep. 28, 1999, has been disclaimed.
Int. Cl.³ C08L 63/00; B01F 17/16
U.S. Cl. 252—357 26 Claims

1. The method for preparing a liquid composition suitable for use in flowable pesticides comprising dissolving a normally solid nonionic polyoxyalkylene block or heteric copolymer in an alkylene glycol at a temperature of at least about 70° C., wherein where said nonionic copolymer is a block copolymer, said alkylene glycol has 3 to 5 carbon atoms and where said nonionic copolymer is a heteric copolymer, said alkylene glycol has 2 to 5 carbon atoms.

4,434,078

LIQUEFIED NORMALLY SOLID POLYOXYALKYLENE COPOLYMERS

Thomas M. Kaneko, Trenton, Mich., assignor to BASF Wyandotte Corporation, Wyandotte, Mich.

Continuation-in-part of Ser. No. 200,118, Oct. 24, 1980, Pat. No. 4,351,753. This application Aug. 2, 1982, Ser. No. 404,196
The portion of the term of this patent subsequent to Sep. 28, 1999, has been disclaimed.
Int. Cl.³ C08L 63/00; B01F 17/16
U.S. Cl. 252—357 13 Claims

1. A liquid composition consisting essentially of a normally solid nonionic polyoxyalkylene block copolymer and at least one alkylene glycol having 3 to 5 carbon atoms.

4,434,079

CONVERSION AND/OR SELECTIVITY OF A ZINC TITANATE CATALYST

Arthur W. Aldag, John H. Kolts, both of Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 5, 1982, Ser. No. 365,203
Int. Cl.³ B01J 23/92, 20/20; C07C 5/333
U.S. Cl. 502/22 8 Claims

1. A process for improving the conversion and/or selectivity of a zinc titanate catalyst, the conversion and/or selectivity of which has been at least partially reduced by use in a process which employs reducing conditions, comprising the step of contacting said zinc titanate catalyst with a solution containing zinc and calcining the thus contacted zinc titanate catalyst in the presence of free oxygen at a temperature in the range to about 500° C. to about 1050° C.

2. A process in accordance with claim 1 wherein the concentration of zinc in said zinc solution is in the range of about 0.1 molar to about saturation and wherein said zinc titanate catalyst is contacted with said zinc solution for a time sufficient to permit said zinc solution to penetrate said catalyst granules.

3. A process in accordance with claim 1 wherein the concentration of zinc in said zinc solution is about 1 molar and wherein said zinc titanate catalyst is contacted with said zinc solution for at least about 5 minutes.

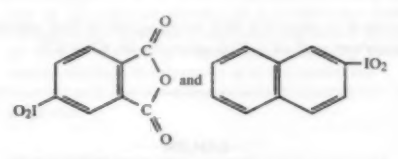
4,434,080

DEHYDROGENATION AGENTS BASED ON DERIVATIVES OF SELENIUM AND THEIR USE IN THE DEHYDROGENATION IN THE 1,4 POSITIONS OF STEROIDS

Derek H. R. Barton, and William B. Motherwell, both of Gif-sur-Yvette, France, assignors to Roussel Uclaf, Paris, France

Filed May 18, 1982, Ser. No. 379,434
Claims priority, application France, May 19, 1981, 81 09917
Int. Cl.³ B01J 31/04, 31/02
U.S. Cl. 502—152 5 Claims

1. A derivative of selenium selected from the group consisting of diphenyl diselenide, benzene seleninic anhydride, benzene seleninic acid, selenic acid and selenium oxide employed in the presence of an oxidation agent consisting of an oxidized derivative of a possibly substituted iodoaromatic compound selected from the group consisting of iodoxy-benzene, metaiodoxy-benzoic acid,



as a dehydrogenation agent.

4,434,081

TITANIUM TRICHLORIDE CATALYTIC COMPONENT AND HOMO- OR CO-POLYMERIZATION OF α-OLEFIN

Yoshikazu Takahashi, Hikari; Yoichi Sunada, Shinnanyo; Toshiharu Tokuhara, Tokuyama, and Masaru Takitani, Shinnanyo, all of Japan, assignors to Toyo Stauffer Chemical Co., Ltd., Tokyo, Japan

Filed Feb. 13, 1981, Ser. No. 234,403
Claims priority, application Japan, Feb. 13, 1980, 55-16419
Int. Cl.³ C08F 4/64
U.S. Cl. 502—154 1 Claim

1. A titanium trichloride catalytic component prepared by a process comprising the steps of:

reducing titanium tetrachloride with an organoaluminum compound represented by the general formula AlR_nX_{3-n}, wherein R represents a hydrocarbon radical

having 1 to 18 carbon atoms, X represents a halogen atom and n is a number represented by the formula $0<n\leqq 3$;

treating the resultant reduced solid with an organic ether compound; and

reacting the treated solid with titanium tetrachloride;

the reducing reaction being carried out in a mixed solvent composed of (1) an aliphatic hydrocarbon and (2) an aromatic hydrocarbon or halogenated aromatic hydrocarbon.

4,434,082

PALLADIUM/HETEROPOLYACID/SURFACTANT CATALYST SYSTEM

Timothy P. Murtha, and Tad K. Shioyama, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 12, 1982, Ser. No. 367,825
Int. Cl.³ B01J *31/02*
U.S. Cl. 502—164 **9 Claims**

1. Composition useful for the catalytic oxidation of olefins to carbonyl compounds comprising:

(a) one or more palladium components;

(b) one or more heteropolyacid components conforming to the general formula

$$H_m[X_xMo_aV_bM_yO_z]$$

in which

X is B, Si, Ge, P, As, Se, Te or I;

M is W, Nb, Ta or Re;

m, a, b and z are integers;

x is zero or an integer;

and y is zero or an integer such that

$$6\leqq(y+a+b)/z\leqq 12$$

and

$$m+Nx+6a+5b+N'y\leqq 2z;$$

in which each of N and N' is the number of the group of the periodic table to which X and M respectively belong;

(c) one or more surfactants selected from the group consisting of: quaternary ammonium salts, alkali metal alkyl sulfates, alkali metal salts of alkanoic acids, alkali metal salts of alkaryl sulfonic acids, and 1-alkyl pyridinium salts; and

(d) two or more liquid phases comprising an aqueous phase and an organic phase.

4,434,083

PROCESS OF PREPARING A CATALYST COMPONENT AND POLYMERIZATION OF α-OLEFINS WITH SUCH A CATALYST COMPONENT

Lambertus J. M. A. van de Leemput, Echt, and Godefridus A. H. Nooijen, Helden-Panninger, both of Netherlands, assignors to Stamicarbon B.V., Geleen, Netherlands

Filed Aug. 5, 1982, Ser. No. 405,375
Claims priority, application Netherlands, Aug. 6, 1981, 8103704
Int. Cl.³ C08F *4/64, 4/68*
U.S. Cl. 502—154 **11 Claims**

1. A process for preparing a Ziegler-type catalyst for the polymerization of α-olefins, comprising:

a. forming a catalyst component by combining a particulate inorganic support with a solution of an organomagnesium compound;

b. heating said catalyst component in a non-reducing atmosphere at a temperature of 300°–1000° C.; and

c. forming the catalyst by combining the thus heat-treated catalyst component with at least one compound of one or more transition metals selected from the group consisting of titanium and vanadium.

4,434,084

BASE METAL CONDUCTOR CATHODE COATING FOR TANTALUM CAPACITORS

William T. Hicks, Lewiston, N.Y., and William C. Seidel, Hockessin, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 23, 1981, Ser. No. 304,890
Int. Cl.³ H01B *1/02*
U.S. Cl. 252—512 **7 Claims**

1. A metallizing composition for use as a capacitor cathode coating comprising (a) 92–97% by weight of a mixture of 70–95% weight finely divided particles of copper and 30–35% wt. finely divided particles of tin-containing metal, dispersed in a solution of (b) 4–1.5% by wt. of an organic acid flux having an acid number of at least 100 and which is thermally stable to a temperature of at least 230° C., and (c) 4–1.5% by wt. of an organic amine corresponding to the formula

wherein R is independently selected from the group consisting of H, C_{1-8} alkyl, C_{2-4} alkenyl and C_{1-4} hydroxy alkyl, at least one of the R groups being alkyl or hydroxyalkyl in (d) an inert organic medium the total amount of resin in the composition being no greater than 4% by wt.

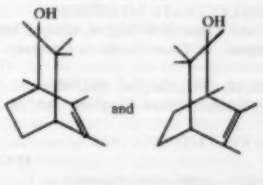
4,434,085

PERFUME OR COLOGNE CONTAINING 1,2,3,3,5,6-HEXAMETHYL-BICYCLO[2.2.2]-OCT-5-EN-2-OL

William J. Evers, Locust; Braja D. Mookherjee, Holmdel; Anton Van Ouwerkerk, Livingston, all of N.J., and Augustinus G. Van Loveren, Rye, N.Y., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Apr. 26, 1982, Ser. No. 371,930
Int. Cl.³ C11B *9/00*; C07C *35/22*
U.S. Cl. 252—522 R **1 Claim**

1. A process for augmenting or enhancing the aroma of a perfume composition or cologne comprising the step of adding to a perfume composition or cologne an aroma augmenting or enhancing quantity of at least one compound having a structure selected from the group consisting of:



4,434,086

PROCESS FOR AUGMENTING OR ENHANCING THE FRESH AIR AROMA OF CLOTHING

Ira D. Hill, Locust; Robert W. Trenkle, Bricktown; Braja D. Mookherjee, Holmdel, and Robin K. Wolff, Point Pleasant, all of N.J., assignors to International Flavors & Fragrances, Inc., New York, N.Y.

Filed Jun. 4, 1982, Ser. No. 384,959
Int. Cl.³ C11B *9/00*
U.S. Cl. 252—522 R **3 Claims**

1. A synthetic or natural fiber textile having a fresh air aroma and having adsorbed on the textile fibers an aroma augmenting or enhancing composition of matter consisting essentially of:

(a) from about 0.5 up to about 5% by weight of said aldehyde composition of n-hexanal;

(b) from about 2 up to about 12% by weight of said aldehyde composition of n-heptanal;
(c) from about 5 up to about 15% by weight of said aldehyde composition of n-octanal;
(d) from about 40 up to about 70% by weight of said aldehyde composition of n-nonanal;
(e) from about 10 up to about 30% by weight of said aldehyde composition of n-decanal;
(f) from about 0.5 up to about 5% by weight of said aldehyde composition of n-undecanal;
(g) from about 0.5 up to about 5% by weight of said aldehyde composition of n-dodecanal;
(h) from about 0.5 up to about 5% by weight of said aldehyde composition of n-tridecanal;
(i) from about 0 up to about 5% by weight of said aldehyde composition of n-tetradecanal;
(j) from about 0 up to about 5% by weight of said aldehyde composition of n-pentadecanal.

2. A process for imparting an "air dried cloth" aroma to cloth previously dried using a clothes drier comprising the step of contacting said cloth, prior to drying, with an aroma augmenting or enhancing quantity of a mixture consisting essentially of:
(a) from about 0.5 up to about 5% by weight of said aldehyde composition of n-hexanal;
(b) from about 2 up to about 12% by weight of said aldehyde composition of n-heptanal;
(c) from about 5 up to about 15% by weight of said aldehyde composition of n-octanal;
(d) from about 40 up to about 70% by weight of said aldehyde composition of n-nonanal;
(e) from about 10 up to about 30% by weight of said aldehyde composition of n-decanal;
(f) from about 0.5 up to about 5% by weight of said aldehyde composition of n-undecanal;
(g) from about 0.5 up to about 5% by weight of said aldehyde composition of n-dodecanal;
(h) from about 0.5 up to about 5% by weight of said aldehyde composition of n-tridecanal;
(i) from about 0 up to about 5% by weight of said aldehyde composition of n-tetradecanal;
(j) from about 0 up to about 5% by weight of said aldehyde composition of n-pentadecanal.

4,434,087

DETERGENT COMPOSITIONS CONTAINING SULPHOSUCCINATE MIXTURES

Jeffrey D. Hampson, and Reginald Billington, both of Merseyside, England, assignors to Lever Brothers Company, New York, N.Y.

Filed Jul. 22, 1982, Ser. No. 400,795

Claims priority, application United Kingdom, Jul. 24, 1981, 8122975

Int. Cl.³ C11D *1/83, 1/12*

U.S. Cl. 252—545 **13 Claims**

1. A foaming detergent composition comprising
(a) a di(C_8 alkyl) sulphosuccinate;
(b) a di(C_6 alkyl) sulphosuccinate; and
(c) one or more anionic non-sulphosuccinate detergent-active agents, and/or one or more nonionic detergent-active agents other than an ethoxylated alcohol or alkyl phenol of the formula:

$$R(C_6H_4)_yO(CH_2CH_2O)_z\,CH_2CH_2OH$$

wherein R is an aliphatic group containing x carbon atoms wherein x is 7 to 21, y is 0 or 1, z is an integer from 6 to 28, and x and z are related by the equation:

$$0.475x-0.33(z+1)=0.4 \text{ to } 1.4;$$

all anionic surfactants being present in the form of salts of solubilising cations; the mole ratio of sulphosuccinates (a) to (b) being within the range from 10:1 to 1:10 and the weight ratio of (a) and (b) to non-sulphosuccinate (c) being within the range of from 1:4 to 20:1.

7. The detergent composition of claim 1, wherein component (c) comprises one or more detergent-active agents selected from the group consisting of alkylbenzene sulphonates; secondary alkane sulphonates; alkyl ether sulphates; primary and secondary alkyl sulphates; alpha-olefin sulphonates; alkyl glyceryl ether sulphonates; fatty acid ester sulphonates; ethoxylated alcohols and alkyl phenols other than specifically excluded in claim 1; propoxylated alcohols and alkyl phenols; amine oxides; betaines; sulphobetaines; and fatty acid mono- and di-lower-alkanolamides.

4,434,088

DETERGENT COMPOSITIONS CONTAINING SULPHOSUCCINATES AND HIGH BLOOM GEL STRENGTH PROTEIN

Reginald Billington, Birkenhead; David J. Edge, Chester, and Peter Winterbotham, Wirral, all of England, assignors to Lever Brothers Company, New York, N.Y.

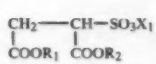
Filed Jul. 22, 1982, Ser. No. 400,793

Claims priority, application United Kingdom, Jul. 24, 1981, 8122832

Int. Cl.³ C11D *1/83, 3/26*

U.S. Cl. 252—547 **10 Claims**

1. A detergent composition suitable for dishwashing, which comprises:
(a) from 2 to 60% by weight of at least one detergent-active dialkyl sulphosuccinate of the formula I:



(I)

wherein each of R_1 and R_2, which may be the same or different, is straight-chain or branched chain alkyl group having from 3 to 12 carbon atoms, and X_1 represents a solubilising cation; and
(b) from 5 to 20% by weight, based on total detergent-active material present of at least one substantially water-soluble protein having a Bloom gel strength of at least 50 g.

7. The detergent composition of claim 1, which further comprises at least one anionic and/or nonionic detergent-active agent selected from the group consisting of alkylbenzene sulphonates, secondary alkyl sulphonates, α-olefin sulphonates, alkyl glyceryl ether sulphonates, primary and secondary alkyl sulphates, alkyl ether sulphates, fatty acid ester sulphonates, alcohol ethoxylates and propoxylates, alkyl phenol ethoxylates and propoxylates, alkyl amine oxides, and fatty acid mono- and dialkanolamides.

4,434,089

DETERGENT COMPOSITIONS CONTAINING SULPHOSUCCINATES AND UNDEGRADED PROTEIN

Reginald Billington, Birkenhead; David J. Edge, Saughall, and Peter Winterbotham, Wirral, all of England, assignors to Lever Brothers Company, New York, N.Y.

Filed Jul. 22, 1982, Ser. No. 400,575

Claims priority, application United Kingdom, Jul. 24, 1981, 8122832

Int. Cl.³ C11D *1/83, 1/12*

U.S. Cl. 252—547 **9 Claims**

1. A detergent composition suitable for dishwashing, which comprises:
(a) from 2 to 60% by weight of at least one detergent-active dialkyl sulphosuccinate of the formula I:

(I)

wherein each of R_1 and R_2, which may be the same or different, is straight-chain or branched chain alkyl group having from 3 to 12 carbon atoms, and X_1 represents a solubilising cation; and

(b) from 5 to 20% by weight, based on total detergent-active material present of at least one substantially water-soluble substantially undegraded protein.

7. The detergent composition of claim 1, which is in liquid form.

4,434,090

DETERGENT COMPOSITIONS CONTAINING SULPHOSUCCINATE MIXTURES

Jeffrey D. Hampson; Reginald Billington, and Ian R. Cox, all of Merseyside, England, assignors to Lever Brothers Company, New York, N.Y.

Filed Jul. 22, 1982, Ser. No. 400,829

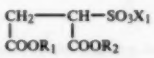
Claims priority, application United Kingdom, Jul. 24, 1981, 8122975; Oct. 5, 1981, 8130062

Int. Cl.³ C11D *1/83, 1/12*

U.S. Cl. 252—547 **23 Claims**

1. A detergent composition comprising

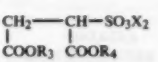
(a) one or more compounds of the formula I



(I)

wherein each of R_1 and R_2, which may be the same or different, represents an alkyl group having from 7 to 9 carbon atoms, and X_1 represents a solubilising monovalent cation or 1/m of a solubilising m-valent cation, and

(b) one or more compounds of the formula II



(II)

wherein one of R_3 and R_4 represents an alkyl group having from 7 to 9 carbon atoms and the other represents an alkyl group having from 3 to 6 carbon atoms, and X_2 represents a solubilising cation which may be the same as or different from X_1 the mole ratio of component (a) to component (b) being within the range from 10:1 to 1:10.

4,434,091

NOVEL SULPHOSUCCINATES AND DETERGENT COMPOSITIONS CONTAINING THEM

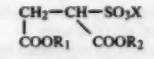
Ian R. Cox, and Keith Jones, both of Wirral, England, assignors to Lever Brothers Company, New York, N.Y.

Filed Jul. 22, 1982, Ser. No. 400,794

Int. Cl.³ C11D *1/16;* **C07C** *149/20*

U.S. Cl. 252—557 **5 Claims**

4. In a detergent composition comprising one or more detergent-active materials in admixture or conjunction with one or more detergent adjuncts, the improvement which comprises including as detergent-active material a compound of the formula I



(I)

wherein one of R_1 and R_2 represents a C_6 alkyl group and the other represents a C_8 alkyl group, and X represents a monovalent solubilising cation or 1/m of a solubilising m-valent cation.

4,434,092

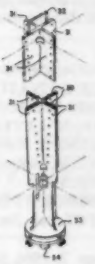
METHOD FOR PREPARING RADIOACTIVE CONTROL RODS FROM NUCLEAR REACTORS FOR STORAGE OR DISPOSAL

Paul Mary, P.O. Box 230, Niantic, Conn. 06357

Filed Apr. 6, 1981, Ser. No. 251,146

Int. Cl.³ G21F *9/34*

U.S. Cl. 252—626 **3 Claims**



1. The method of preparing radioactive control rods from nuclear reactors for disposal or storage off site comprising cutting off the handle ends of the rods from the blade portions while those rods are submerged in water in a pit, thereby separating the highly radioactive handle end portions of the rods from the less radioactive blade portions, so that the highly radioactive portions and the less radioactive portions may be disposed of separately.

4,434,093

METHODS FOR PREPARATION OF HB_5Ag FREE GAMMA GLOBULINS

Raymond P. Zolton, Somerville; Paul M. Kaplan, Sergeantsville, and John V. Padvelskis, S. Somerville, all of N.J., assignors to Ortho Diagnostic Systems Inc., Raritan, N.J.

Filed Jul. 26, 1982, Ser. No. 401,761

Int. Cl.³ A61K *39/12, 39/42, 37/06;* **C07G** *7/00*

U.S. Cl. 260—112 B **6 Claims**

1. A method for removing substantially all HB_5Ag from a gamma globulin containing body fluid comprising the steps of:

(a) providing the gamma globulin containing body fluid desired to be purified;

(b) applying the body fluid to column means containing an effective amount of resin selected from the group consisting of DEAE-Sephadex and QAE-Sephadex;

(c) eluting the body fluid from the column with a buffer selected from the group consisting of approximately 0.02 M phosphate buffer if the resin selected is QAE-Sephadex and approximately 0.04 M Tris buffer if the resin selected is DEAE-Sephadex or QAE-Sephadex, each buffer adjusted to a pH of approximately 7.5;

(d) monitoring the column effluent for the presence of protein;

(e) collecting, responsive to monitoring, the protein containing effluent whereby substantially HB_5Ag free gamma globulin is obtained.

4,434,094

PARTIALLY PURIFIED OSTEOGENIC FACTOR AND PROCESS FOR PREPARING SAME FROM DEMINERALIZED BONE

Saeid Seyedin, Mt. View, and Thomas Thomas, Palo Alto, both of Calif., assignors to Collagen Corporation, Palo Alto, Calif.

Filed Apr. 12, 1983, Ser. No. 484,286

Int. Cl.³ C07G *7/00*

U.S. Cl. 260—112 R **10 Claims**

1. A process for partially purifying an osteogenic factor from particulate demineralized bone comprising:

(a) extracting nonfibrous proteins from the demineralized

bone with a liquid dissociative nonfibrous protein extractant;

(b) contacting the extract of (a) with an anion exchanger at a pH of about 6.8 to about 7.2.

(c) contacting the unadsorbed fraction of the extract with a cation exchanger at a pH of about 4.5 to about 5.2;

(d) eluting the adsorbed fraction from the cation exchanger; and

(e) isolating nonfibrous protein having a molecular weight below about 30,000 daltons from the eluate of (d).

4,434,095

CYCLIC ANALOGUE OF NATURALLY-OCCURRING PHAGOCYTOSIS-STIMULANT PEPTIDE - THREONYL-CYCLO-[-N$^{\epsilon}$-LYSYL-PROLYL-ARGINYL]

Gunar I. Chipens; Nadezhda I. Veretennikova, and Zeltite A. Atare, all of Riga, U.S.S.R., assignors to Institute Organicheskogo Sinteza, Riga, U.S.S.R.

PCT No. PCT/SU80/00060, § 371 Date Dec. 12, 1980, § 102(e) Date Dec. 12, 1980, PCT Pub. No. WO80/02141, PCT Pub. Date Oct. 16, 1980

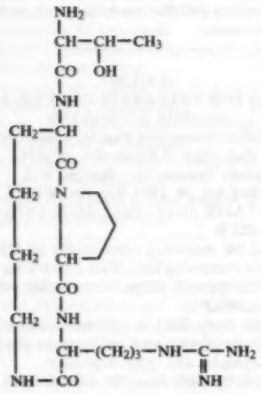
PCT Filed Apr. 2, 1980, Ser. No. 227,055

Claims priority, application U.S.S.R., Feb. 4, 1979, 2744960

Int. Cl.^{3} C07C *103/52*

U.S. Cl. 260—112.5 R **2 Claims**

1. A cyclic analogue of a naturally-occurring phagocytosis-stimulant peptide—threonyl-cyclo-[-N$^{\epsilon}$-lysyl-prolyl-arginyl-] of the formula:



4,434,096

SUBSTRATES FOR THE QUANTITATIVE DETERMINATION OF PROTEOLYTIC ENZYMES

Patrick L. Coleman, Ypsilanti, Mich., and John A. Wehrly, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 30, 1981, Ser. No. 279,161

Int. Cl.^{3} C07C *103/52*

U.S. Cl. 260—112.5 R **4 Claims**

1. Tripeptide thiol ester substrates consisting essentially of compounds having the structure:

$$H—AA_3—AA_2—AA_1—S—R$$

wherein

AA_3 is a D-configuration amino acid; and where

AA_3 is selected from the group consisting of Val, Pro, Gly, Phe, Ala, Ile, Leu, Glu and Pip;

AA_2 is selected from the group consisting of Leu, Pro, Ala, Phe, Val, Tyr, Thr and Pip;

AA_1 is selected from the group consisting of Lys, Arg and Orn; and

R is an alkyl group of 1–4 carbon atoms or benzyl; and biologically compatible salts thereof.

4,434,097

PROCESS FOR THE REMOVAL OF THE FORMYL GROUP FROM N-FORMYL PEPTIDES AND ESTERS THEREOF

Vincenzo Giobbio, Turin; Giorgio Ornato; Livio Buracchi, both of Ivrea, and Alberto Mangia, Milan, all of Italy, assignors to Pierrel S.p.A., Naples, Italy

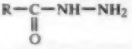
Filed Apr. 26, 1982, Ser. No. 372,216

Claims priority, application Italy, May 13, 1981, 21674 A/81

Int. Cl.^{3} C07C *103/52*

U.S. Cl. 260—112.5 R **10 Claims**

1. A process for the removal of the formyl group in a compound which contains an N-formyl group of formula NH—CHO and the compound is a peptide containing an ester group and wherein the —NH group of the NH—CHO group is attached to a carbon atom adjacent to the —CONH— grouping of said peptide, which consists of reacting said compound with hydrazine or a substituted hydrazine of formula I:



wherein R is a saturated or unsaturated, linear or branched, substituted or unsubstituted alkyl of 1–5 carbon atoms, or substituted or unsubstituted cycloalkyl or substituted or unsubstituted aryl or an amino group at a pH between 1 and 3.5, keeping the pH constant during the reaction, wherein the N-formyl group is removed while the ester group is not attacked, and isolating the ester of the N-deformylated peptide from the reaction mixture.

4,434,098

SUBSTITUTED BENZOTELLUROPYRONES

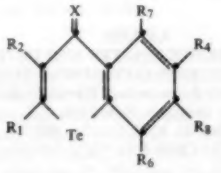
Michael R. Detty; Bruce J. Murray, and Jerome H. Perlstein, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 1, 1981, Ser. No. 279,300

Int. Cl.^{3} C07D *345/00*

U.S. Cl. 260—239 R **5 Claims**

2. A substituted benzotelluropyrone compound having the structure:



(III)

wherein,

R_1 and R_2 each independently represents hydrogen, alkyl, alkoxy, halogen or aryl, or together with the carbon atoms to which they are attached form a mono- or polycyclic, carbocyclic fused ring structure having 5 to 20 carbon atoms;

R_7 and R_8 each independently represents an electron donating group, hydrogen, alkyl or aryl;

R_4 and R_6 each independently represents hydrogen, halogen or alkyl; or R_4 and R_7, or R_4 and R_8, together with the carbon atoms to which they are attached, form a mono- or polycyclic, carbocyclic fused ring structure having 5 to 20 carbon atoms; or

R_6 and R_8, together with the carbon atoms to which they are attached, form a mono- or polycyclic, carbocyclic fused ring structure having 5 to 20 carbon atoms;

X represents O, S or Se;

provided that when R_1 is methyl, at least one of R_2, R_4, R_6, R_7 and R_8 is other than hydrogen.

4,434,099

BETA-LACTAM COMPOUNDS CONTAINING A PROTECTED C-ACETYL GROUP, PROCESS FOR THEIR PREPARATION AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Karoly Lempert; Kalman Harsanyi; Gabor Doleschall; Gyula Hornyak; Jozsef Nyitrai, all of Budapest; Karoly Zauer, Szentendre; Jozsef Fetter, Budapest; Gyula Simig, Budapest; Zsuzsanna Gombos nee Visky, Budapest, and Gizella Szalai nee Barta, Vecses, all of Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt., Budapest, Hungary

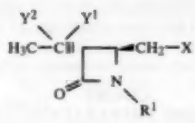
Filed Sep. 11, 1981, Ser. No. 301,883

Claims priority, application Hungary, Sep. 15, 1980, 2263/80

Int. Cl.³ C07D *205/08, 407/04*

U.S. Cl. 260—239 A 8 Claims

1. A compound of the formula (VI)



(VI)

wherein

R^1 is hydrogen, benzyl or benzyl substituted by one or two methoxy groups;

X is hydroxyl, halogen, cyano, or an —O—SO_2—R^2 group, in which

R^2 is lower alkyl or aryl; and

Y^1 and Y^2 together with the carbon atom to which they are attached form together a 1,3-dioxolan-2-yl group or a thio analog thereof.

4,434,100

7(2-THIENYL)DIBENZ[c,e]AZEPINES

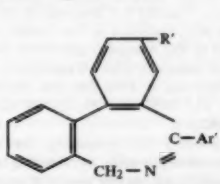
Heinz W. Gschwend, New Providence, N.J., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 106,645, Dec. 26, 1979, Pat. No. 4,315,926. This application Nov. 14, 1980, Ser. No. 206,939

Int. Cl.³ C07D *411/04;* A61K *31/38*

U.S. Cl. 260—330.3 3 Claims

1. A compound having the formula



wherein Ar' is thienyl and R' is fluoro, chloro, bromo or trifluoromethyl; or a pharmaceutically acceptable acid addition salt thereof.

4,434,101

INHIBITORS OF SRS-SYNTHESIS

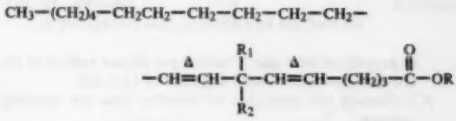
Noal Cohen, Montclair, and Giuseppe Weber, Cedar Grove, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Sep. 14, 1981, Ser. No. 301,614

Int. Cl.³ C11C *3/02;* A61K *31/23*

U.S. Cl. 260—410.9 R 3 Claims

1. A compound of the formula:



wherein Δ designates a cis configuration, R is hydrogen or lower alkyl; and R_1 and R_2 are hydrogen or methyl with the proviso that where one of R_1 and R_2 is hydrogen the other is methyl, and pharmaceutically acceptable salts thereof where R is hydrogen.

4,434,102

PREPARATION OF MIXTURES OF METHYLTIN TRICHLORIDE AND DIMETHYLTIN DICHLORIDE FROM STANIC CHLORIDE AND DIMETHYLTIN DICHLORIDE WITHOUT CATALYST AND CONVERSION TO MIXED METHYLTIN MERCAPTIDE STABILIZERS

Gerald Spiegelman, Wayne, and Koei-Liang Liauw, Wyckoff, both of N.J., assignors to Witco Chemical Corporation, New York, N.Y.

Division of Ser. No. 59,094, Jul. 19, 1979, Pat. No. 4,269,782. This application Jan. 23, 1981, Ser. No. 227,899

Int. Cl.³ C07F *7/22*

U.S. Cl. 260—429.7 3 Claims

1. In a process of preparing a mixed methyltin mercaptide stabilizer for vinyl chloride polymers in which the weight proportions of monomethyltin trimercaptide to dimethyltin dimercaptide range from 6:1 to 1:3, comprising the steps of treating a mixture of dimethyltin dichloride and monomethyltin trichloride with a mercaptan and an acid acceptor, and recovering the stabilizer mixture of monomethyltin trimercaptide and dimethyltin dimercaptide, the improvement wherein said mixture of dimethyltin dichloride and monomethyltin trichloride is prepared by heating dimethyltin dichloride with 0.1 to 0.7 molar proportion of stannic chloride in the absence of catalyst, without further purification.

4,434,103

SUBSTITUTED SILICON-OXYGEN-ALUMINUM OLIGOMERS AND PREPARATION THEREOF

Leonard V. Interrante, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

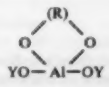
Filed Sep. 18, 1981, Ser. No. 303,447

Int. Cl.³ C07F *5/06*

U.S. Cl. 260—448 B 4 Claims

1. A method for making organic solvent soluble aluminum-oxygen-silicon oligomers useful for providing an aluminosilicate coating on a ceramic, metal or metal alloy substrate which comprises

(A) hydrolyzing a chelated aluminum alkoxide of the formula,



with water using M moles of chelated aluminum alkoxide, where M has a value of 2 to 5, per M-1 moles of water, to

produce low molecular weight alkoxy-terminated aluminum-oxygen oligomer,

(B) coreacting the low molecular weight alkoxy terminated aluminum oxygen oligomer of (A) with a sufficient amount of a difunctional organosilane of the formula,

to provide at least one X radical per alkoxy radical of the chelated aluminum oxide oligomer of (A), and

(C) effecting the separation of volatiles from the resulting mixture,

where Y is a monovalent $C_{(1-13)}$ hydrocarbon radical, R is selected from polyvalent organic radicals, R^1 and R^2 are selected from monovalent hydrocarbon radicals and substituted monovalent hydrocarbon radicals selected from the group consisting of cyanoethyl and trifluoropropyl, and X is an acyloxy, hydroxy or halogen radical.

4,434,104

PREPARATION OF HIGH PURITY DI-LOWER ALKYL NAPHTHALENEDISULFONATES

Shuji Tsuchiya; Hisao Ikeda, and Kenji Suzuki, all of Funabashi, Japan, assignors to Nissan Chemical Industries, Ltd., Tokyo, Japan

Filed Jun. 11, 1982, Ser. No. 387,605

Claims priority, application Japan, Jun. 17, 1981, 56-93372; Jun. 24, 1981, 56-98054

Int. Cl.³ C07C *143/68*

U.S. Cl. 260—456 P **23 Claims**

1. In a process for preparing a di-lower alkyl naphthalenedisulfonate of the formula:

wherein R is selected from a methyl group and an ethyl group, said sulfonate groups being in either the 1,5- or 2,6-position,

by reacting a naphthalenedisulfonyl chloride of the formula:

wherein the substituent groups are in either the 1,5- or 2,6-position,

and a stoichiometrically excess amount of an aliphatic alcohol of the formula:

ROH

in the presence of an aqueous alkali solution, the improvement comprising removing water from the reaction system, treating the reaction product with an alkali metal alcoholate of the formula:

ROM

wherein M is selected from a sodium atom and a potassium atom, in the presence of a solvent and then washing the treated reaction product with water.

10. A process for preparing a di-lower alkyl naphthalenedisulfonate of the formula:

wherein R is selected from a methyl group and an ethyl group, said sulfonate groups being in either the 1,5- or 2,6-position,

comprising adding a naphthalenedisulfonyl chloride of the formula:

and an aqueous alkali solution in portions to a stoichiometrically excess amount of an aliphatic alcohol of the formula:

ROH

wherein each portion of said chloride being added to said aliphatic alcohol prior to the corresponding portion of said aqueous alkali solution, and wherein the chemical equivalent ratio of said alkali to said chloride is maintained below 1.1, and adjusting the chemical equivalent ratio is between 1.0 and 1.2 upon completion of the addition of said portions.

4,434,105

PROCESS FOR THE PREPARATION OF DIALKYL CARBONATES

Hans-Josef Buysch; Heinrich Krimm, and Hans Rudolph, all of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 51,658, Jun. 25, 1979, abandoned. This application Jun. 27, 1980, Ser. No. 163,912

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1977, 2748718

Int. Cl.³ C07C *68/00, 69/96*

U.S. Cl. 260—463 **9 Claims**

1. A process for preparing a carbonate which comprises contacting an alkylene oxide having 2 to 8 carbon atoms with an aliphatic or cycloaliphatic alcohol having 1 to 18 carbon atoms selected from the group consisting of methanol, ethanol, propanol, isopropanol, n-butanol, isobutanol, amyl alcohol, cyclohexanol, octanol, decanol, and cyclododecanol and excess carbon dioxide under a partial carbon dioxide pressure of 3 to 500 bars employing excess alcohol to alkylene oxide in the presence of a catalyst which is a thallium catalyst at a temperature of from 70° to 300° C.

4,434,106

PROCESS FOR PREPARING PERFLUOROTRIAZINE ELASTOMERS AND PRECURSORS THEREOF

Robert W. Rosser; Timothy S. Chen, and Chung-Heng Cheng, all of San Jose, Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Apr. 6, 1982, Ser. No. 366,025

Int. Cl.³ C07C *123/00, 120/00, 121/43*

U.S. Cl. 260—465.5 R **6 Claims**

1. In the process for preparing an oligomeric perfluoro(imidoylamidine)dinitrile by reacting an original perfluorodinitrile selected from the group of materials having the formula NC—R_f—CH wherein R_f is selected from bivalent fluorocarbon radicals of the formula —(C_pF_{2p})—, wherein p is a number from 2 to 18 inclusive, and bivalent oxyfluorocarbon radicals of the formula

$$-CFY(OCF_2CFY)-O-(CF_2)-O-(CFYCF_2O)-CFY-$$

wherein Y is F or CF_3, q is a number from 1 to 18 and m and n are each numbers, the sum of which is from 2 to 7 with ammonia, the improvement comprising conducting the reaction in two steps, a first step comprising reacting at least 10 equivalents of liquid ammonia and said original perfluorodinitrile at a temperature of from −60° C. to −33° C. for from 0.1 to 24 hours to yield a perfluorodiamidine and unreacted ammonia, and, following removing at least 99% of said excess ammonia from said perfluorodiamidine, a second step comprising reacting said perfluorodiamidine with from 1.5 to 2.5 equivalents of said original perfluorodinitrile or another perfluorodinitrile selected from the same group of materials for 1 to 72 hours at 0° C. to 70° C. to yield a perfluoro(imidoylamidine)dinitrile.

4,434,107

PROCESS FOR PREPARING AN OPTICALLY ACTIVE P-HYDROXYPHENYLGLYCINE OR A SALT THEREOF

Ichiro Chibata, Saita; Shigeki Yamada, Toyonaka; Chikara Hongo, Osaka, and Ryuzo Yoshioka, Kaizuka, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

Filed Jun. 28, 1982, Ser. No. 392,535

Claims priority, application Japan, Jul. 9, 1981, 56-108008

Int. Cl.³ C07C *143/30, 101/72*

U.S. Cl. 260—501.12 **13 Claims**

1. A process for preparing an optically active p-hydroxyphenylglycine salt which comprises the steps of:

(a) forming a supersaturated solution of the racemic modification of a p-hydroxyphenylglycine salt selected from the class consisting of p-hydroxyphenylglycine benzenesulfonate, p-hydroxyphenylglycine p-toluenesulfonate, p-hydroxyphenylglycine o-toluenesulfonate, p-hydroxyphenylglycine sulfosalicylate, p-hydroxyphenylglycine p-ethylbenzenesulfonate, p-hydroxyphenylglycine 2-naphthol-6-sulfonate and p-hydroxyphenylglycine β-naphthalenesulfonate in a lower aliphatic acid of the formula:

$$R^1—COOH \quad (I)$$

wherein R^1 is hydrogen or alkyl having one to 4 carbon atoms, said lower aliphatic acid being present in an amount of about 2 to about 50 g per g of said p-hydroxyphenylglycine salt, said supersaturated solution also containing an aliphatic or aromatic aldehyde of the formula:

$$R^2—CHO \quad (II)$$

wherein R^2 is hydrogen; alkyl having one to 6 carbon atoms; alkenyl having 2 to 4 carbon atoms; phenyl; phenyl having at least one substituent selected from the class consisting of hydroxy, nitro, amino and alkoxy of one to 4 carbon atoms; phenylvinyl; oxygen-containing heteromonocyclic group; and hydroxynaphthyl, said aldehyde being present in an amount of 0.001 to 0.5 mole per mole of DL-p-hydroxyphenylglycine salt, and

(b) contacting said supersaturated solution with seed crystals of a desired enantiomer of said p-hydroxyphenylglycine salt at a temperature not lower than 50° C., thereby allowing preferential crystallization of said desired enantiomer to take place from said supersaturated solution with simultaneous racemization of the other enantiomer dissolved therein.

4,434,108

HERBICIDALLY ACTIVE 2-NITRO-5-(2'-CHLORO-4'-TRIFLUOROMETHYLPHENOXY)PHENYLPHOSPHINIC ACID DERIVATIVES

Ludwig Maier, Arlesheim, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

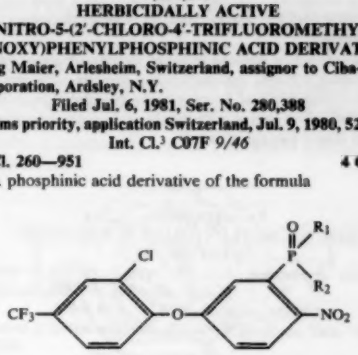
Filed Jul. 6, 1981, Ser. No. 280,388

Claims priority, application Switzerland, Jul. 9, 1980, 5251/80

Int. Cl.³ C07F *9/46*

U.S. Cl. 260—951 **4 Claims**

1. A phosphinic acid derivative of the formula



in which

R_1 is C_1–C_4 alkyl optionally substituted by chlorine, or is phenyl, and

R_2 is hydroxy, C_1–C_4 alkoxy or chlorine.

4,434,109

PHOSPHONOUS ACID MONOESTER-MONOAMIDES

Michael Rasberger, Riehen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

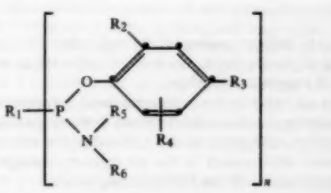
Filed Jun. 8, 1981, Ser. No. 271,319

Claims priority, application Switzerland, Jun. 16, 1980, 4617/80

Int. Cl.³ C07F *9/24*

U.S. Cl. 260—958 **7 Claims**

1. A compound of formula I



(I)

in which n is 1, R_1 is C_1–C_{18} alkyl or phenyl, R_2 is hydrogen or C_1–C_8 alkyl, R_3 is hydrogen or C_1–C_8 alkyl, R_4 is hydrogen or C_1–C_8 alkyl, R_5 and R_6 being independent of one another and representing C_1–C_{12} alkyl or cyclohexyl.

4,434,110

CARBURETOR, CONTROL APPARATUS AND METHOD FOR INTERNAL COMBUSTION ENGINES

William Highfield, Sacramento, Calif., assignor to Fuel Systems Management, Roseville, Calif.

Filed Mar. 23, 1981, Ser. No. 246,402

Int. Cl.³ F02M *9/12*

U.S. Cl. 261—36 A **30 Claims**

1. A carburetor for an internal combustion engine, comprising:

(a) a carburetor head having a fuel mixing chamber;

(b) a fuel inlet conduit in the head for communicating fuel to the fuel mixing chamber;

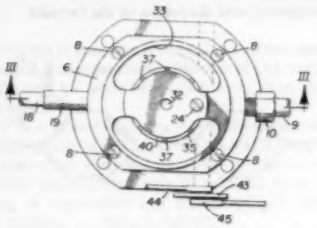
(c) means, in the fuel inlet conduit, for metering the fuel entering the fuel mixing chamber;

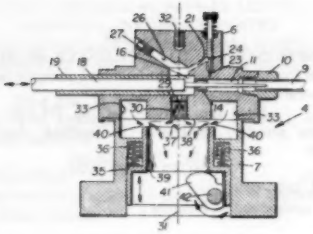
(d) an air inlet conduit in the head for communicating air to the fuel mixing chamber;

(e) means, in the air inlet conduit, for metering the air entering the fuel mixing chamber;

(f) an expansion chamber in the carburetor head communicating with the mixing chamber in series through a control orifice;

(g) a carburetor housing attached to the carburetor head and having a throat communicating directly with the expansion chamber, said housing being mountable on an internal combustion engine with the throat in communication with an intake passage thereof;





(h) an air delivery passage in the carburetor for communicating air to the throat at a location adjacent to an outlet of said expansion chamber;

(i) an air valve in the carburetor head for metering the air entering the throat from the air delivery passage; and

(j) means, connected to the carburetor, for moving the air valve with respect to the air delivery passage in correspondence with the fuel metering means.

4,434,111

VARIABLE VENTURI-TYPE CARBURETOR

Mitsuyoshi Teramura; Masatami Takimoto, both of Toyota; Norihiko Nakamura, Mishima; Takaaki Itou, Mishima; Takashi Katou, Mishima; Takeru Yasuda, and Sunao Kitamura, both of Nagoya, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha and Aisan Industry Co., Ltd., both of, Japan

Filed Aug. 25, 1982, Ser. No. 411,281

Claims priority, application Japan, Feb. 16, 1982, 57-22051

Int. Cl.³ F02M 9/06

U.S. Cl. 261—44 C **13 Claims**

1. A variable venturi-type carburetor comprising:

an intake passage formed in said carburetor and having an inner wall;

a casing having therein an interior chamber which extends perpendicular to said intake passage;

a suction piston movably inserted into said casing and having a tip face which projects into said intake passage and defines a venturi portion, said suction piston dividing the interior chamber of said casing into an atmospheric pressure chamber and a vacuum chamber which is connected to said venturi portion for moving said suction piston in response to a change in the amount of air flowing within said intake passage;

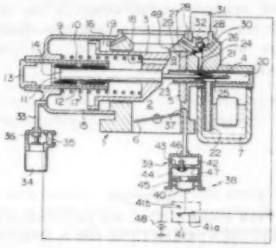
a throttle valve arranged in said intake passage located downstream of said suction piston;

a fuel passage having a metering jet therein and being open to said intake passage for feeding fuel into said intake passage;

a needle fixed onto the tip face of said suction piston and extending through said fuel passage and said metering jet;

an air bleed passage having an air inlet and an air outlet which is open to said fuel passage, said air inlet being open to the atmosphere;

an air feed passage having an air inlet and an air outlet which is open to said vacuum chamber, said air inlet being open to the atmosphere;



first valve means arranged in said air bleed passage for controlling the flow area of said air bleed passage;

second valve means arranged in said air feed passage for controlling the fluid connection between said vacuum chamber and the atmosphere; and

means controlling said first valve means and said second valve means in response to a change in the level of load of an engine for reducing the flow area of said air bleed passage and shutting off said air feed passage when the level of load of the engine is lower than a predetermined level and for increasing the flow area of said air bleed passage and opening said air feed passage when the level of load of the engine is higher than the predetermined level.

4,434,112

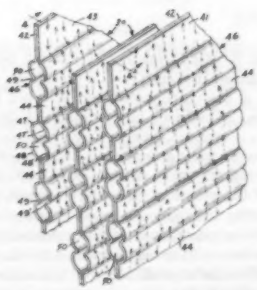
HEAT TRANSFER SURFACE WITH INCREASED LIQUID TO AIR EVAPORATIVE HEAT EXCHANGE

John J. Pollock, Waynesboro, Pa., assignor to Frick Company, Waynesboro, Pa.

Continuation-in-part of Ser. No. 308,967, Oct. 6, 1981, abandoned. This application Oct. 28, 1982, Ser. No. 437,409

Int. Cl.³ B01F 3/04

U.S. Cl. 261—153 **6 Claims**



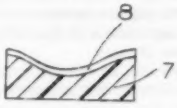
1. A condenser tube assembly, comprising a plurality of

spaced substantially vertical, parallel tube sections, each tube section including a pair of plates connected together along their outer periphery and along spaced horizontal bands within said periphery, facing portions of said plates intermediate said bands being expanded to form parallel tube portions, and connecting portions at alternate ends of said tube portions connecting said tubes in serpentine fashion to provide a unitary tube, the opposite ends of said tubes having free end portions for connection to a source of fluid to be condensed and for discharge of the condensed fluid, respectively, each of said tubes having upper and lower concave facing portions connected by facing portions spaced relatively closer together, said sections being arranged side by side so that the spaced connected horizontal bands of alternate sections are substantially directly opposite in a horizontal plane to the facing portions spaced relatively closer together of each of said tubes, means for introducing a liquid coolant onto the upper portions of said condenser assembly so that said coolant flows down each tube section by gravity in heat exchange relationship with the fluid to be condensed, and means for introducing a flow of air into said condenser assembly and causing said air to flow upwardly between said tube sections and impinge upon said facing portions.

4,434,113
SPIN CASTING LENSES HAVING REDUCED SPHERICAL ABERRATION

Charles W. Neefe, P.O. Box 429, 811 Scurry St., Big Spring, Tex. 79720

Filed Jul. 13, 1982, Ser. No. 397,845
Int. Cl.³ B29D *11/00*
U.S. Cl. 264—2.1 **2 Claims**



1. Method of making a contact lens having equal convex and concave aspheric surfaces comprising the steps of (a) spin casting a soluble resinous material on a rotating mold of soluble resin having a spherical concave surface to form a layer having a concave aspheric surface produced by the physical forces acting on a rotating liquid, (b) depositing a metal film on the concave aspheric surfaced layer, (c) electroplating a supporting metal layer on the metal film, (d) removing the soluble resinous materials from the metal film, (e) molding a concave resinous aspheric surfaced optical replica against the convex aspheric surface of the metal film, (f) separating the metal film from the resinous optical replica, and (g) spin casting a contact lens on the concave aspheric surface of the resinous optical replica while it is rotating; said contact lens having an equal aspheric curve on the concave and convex lens surfaces.

4,434,114
PRODUCTION OF WRINKLE-FREE PIEZOELECTRIC FILMS BY POLING

Oliver S. Sprout, Jr., Glenside, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

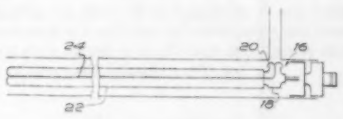
Filed Feb. 4, 1982, Ser. No. 345,858
Int. Cl.³ H04R *17/00*
U.S. Cl. 264—22 **15 Claims**

1. A process for treating oriented PES film for producing wrinkle-free piezoelectric film comprising applying a high strength dc field to a single or multi-layer of film, at least one layer of which is an oriented PES film, sandwiched between and in contact with resilient conductive rubber liners, at a temperature range of from about room temperature to a temperature just below the melting point of the film, the single or multi-layer with liners being disposed between a single set of oppositely charged electrodes with the liners in contact with the electrodes, and maintaining the dc field until a piezoelectric activity of at least 5 pC/N is induced in at least one of the PES oriented films, said liners being able to move freely with the film as the film is being exposed to the high strength dc field, and thereafter cooling the multi-layer to below about 50° C. before or after removing the dc field, removing the dc field and thereafter grounding the oriented PES film to remove surface charge.

4,434,115
METHOD FOR REMOTE LINING OF SIDE CONNECTIONS

Douglas K. Chick, Elstree, England, assignor to Insituform International, Inc., Channel Islands

Filed Feb. 11, 1982, Ser. No. 348,072
Claims priority, application United Kingdom, Feb. 18, 1981, 8105126
Int. Cl.³ B29C *27/16*
U.S. Cl. 264—36 **7 Claims**



1. A method of lining the interior of a lateral pipe that extends laterally with respect to an elongated substantially horizontal underground pipeline and which lateral pipe opens into the side of said substantially horizontal underground pipeline by means of a side connection opening in said pipeline, which method comprises

(a) introducing into the interior of said substantially horizontal underground pipeline an elongated liner tube everting unit, so that the length direction of the liner tube everting unit is aligned with the length direction of the pipeline,

(b) from a control point located outside of said horizontal underground pipeline causing said liner tube everting unit to move along the interior of said substantially horizontal underground pipeline to a position which is near said side connection opening,

(c) from a control point located outside of said horizontal underground pipeline aligning a liner tube everting outlet on said liner tube everting unit with said side connection opening, and

(d) employing a fluid pressure differential to evert a flexible extendible liner tube laterally from said liner tube everting unit

(1) first through said side connection opening, and

(2) then progressively along the interior of said lateral pipe.

4,434,116
METHOD FOR MAKING A POROUS FLUORINATED POLYMER STRUCTURE

Michael J. Covitch, Cleveland Hts., Ohio, assignor to Diamond Shamrock Corporation, Dallas, Tex.

Filed Jun. 26, 1981, Ser. No. 277,884
Int. Cl.³ B29D *27/00*
U.S. Cl. 264—49 **15 Claims**

1. A method for forming a porous, resinous structure comprising the steps of:

blending a fluorinated polymer or fluorinated copolymer and a dispersion media;

heating the blend to a temperature between the melting point of the dispersion media and the boiling point of the dispersion media;

maintaining the temperature until said fluorinated polymer

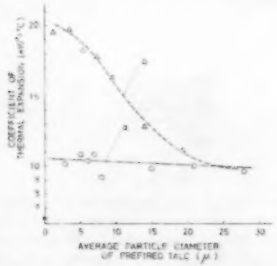
or fluorinated copolymer at least partially dissolves in said dispersion media thereby forming a dispersion;
forming a desired structure from the blend;
cooling the blend to cause syneresis of droplets of dispersion media within dispersion; and
continuing cooling causing crystallization of substantially all of said droplets; and
removing the droplets to leave pores within the structure.

4,434,117

METHOD FOR PRODUCING A CORDIERITE BODY

Kazuhiro Inoguchi, Okazaki; Tomohiko Nakanishi, Kariya, and Mitsuru Asano, Okazaki, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Apr. 2, 1981, Ser. No. 250,150
Claims priority, application Japan, Apr. 4, 1980, 55-45016; Apr. 4, 1980, 55-45017
Int. Cl.³ C04B 35/18
U.S. Cl. 264—56 11 Claims



1. A method for producing a body consisting substantially completely of polycrystalline sintered cordierite said method comprising the successive steps of:
(a) delaminating a talc stack along the (OOl) plane thereof into plate-shaped talc particles, each particle having an average particle diameter of about 2.8 to about 30 microns;
(b) firing the so obtained plate-shaped talc particles;
(c) mixing and kneading a batch raw material containing the fired plate-shaped talc particles produced in step (b) together with non-plate-shaped particles of another ceramic material
selected from the group consisting of aluminum hydroxide, alumina, silica and kaolin
and preparing a slurry, provided that the particles of said other ceramic material have an average diameter smaller than that of the fired plate-shaped talc particles;
(d) anisostatically forming the slurry into a formed body having a predetermined shape while imparting a planar orientation to the plate-shaped talc particles; and thereafter
(e) drying and firing the thus formed body.

4,434,118

COMPACTING POLYCARBONATE AND COPOLY(CARBONATE/PHOSPHONATE) PARTICLES

Ruey Y. Lin, New City, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Continuation of Ser. No. 219,567, Dec. 23, 1980, abandoned. This application Jul. 22, 1982, Ser. No. 400,827
Int. Cl.³ B01J 2/22
U.S. Cl. 264—109 7 Claims

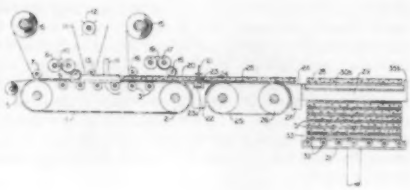
1. A process for producing a polycarbonate particulate product having increased bulk density suitable for plastic shaping comprising mechanically compacting particles of a polycarbonate resin having a bulk density of about 0.1 gm/cm³ using a pressure of from about 100 to about 5000 atmospheres to produce a polycarbonate product having a bulk density of greater than about 0.9 g/cm³.

4,434,119

METHOD FOR PRODUCING CONCRETE PANELS

John W. Teare, 26 Hollytree Ct., Hamilton, Ohio 45011

Continuation-in-part of Ser. No. 126,192, Mar. 3, 1980, Pat. No. 4,298,413. This application Oct. 29, 1981, Ser. No. 316,146
Int. Cl.³ B28B 1/14, 1/30, 7/06
U.S. Cl. 264—145 1 Claim



1. A process for producing fabric-reinforced concrete panels which comprises depositing on a moving conveyor belt a web of water-absorbent paper treated with a concrete release agent, depositing on said paper web a continuous strip of uncured, fabric-reinforced concrete, cutting said strip including said paper web into panels, stacking said uncured panels with a layer of said paper web between adjacent panels, curing said stack of panels under non-drying conditions until said panels have hardened, and subsequently subjecting said stack of hardened panels to air drying at ambient conditions whereby moisture from within said stack is dissipated through the wicking action of said layers of paper.

4,434,120

INJECTION MOLDED KNOCKOUT

Charles J. Aloisio, Jr., Chamblee, and Ray R. Cammons, Woodstock, both of Ga., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

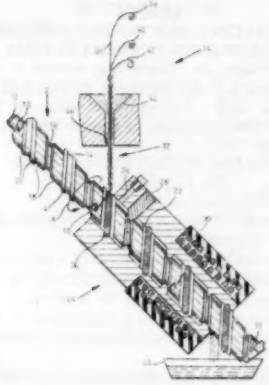
Filed Oct. 9, 1981, Ser. No. 309,980
Int. Cl.³ B29F 1/00
U.S. Cl. 264—155 9 Claims

1. A method of making an article by steps comprising introducing fluid polymer or prepolymer material into a cavity, allowing said material to at least partially solidify, and thereafter removing said material from said cavity, characterized in that
a portion of said material flows through one or more gates between a first region of said cavity and a second region of said cavity, whereby the boundary between the resulting first and second regions of the article exclusive of the one or more gates is a weld line formed by the flow front of said material, thereby producing an article having at least one removable piece.

4,434,121
METHOD FOR PRODUCTION OF A HELICAL SPRING FROM A FIBER-REINFORCED PLASTIC

Siegfried Schäper, Wettstetten, Fed. Rep. of Germany, assignor to Audi Nsu Auto Union Aktiengesellschaft, Neckarsulm, Fed. Rep. of Germany

Filed Oct. 1, 1981, Ser. No. 307,590
Int. Cl.³ B29F 3/10
U.S. Cl. 264—174 5 Claims



1. A method of making a helical spring which comprises the steps of:

rotating an inner cylindrical member formed with an outwardly open helical groove around the axis of said member;

enclosing said inner member in an outer member formed with an axially extending bore provided with an inwardly open helical groove registering with the outwardly open helical groove to define a closed cross section for a spring to be formed in said grooves;

feeding a strand of fiber reinforced synthetic resin in a plastically deformable state into said outwardly open groove thereby entraining said strand into said outer member and molding said strand to said cross section between the grooves of said members; and

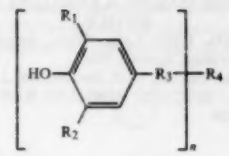
axially shifting said members relatively corresponding to the pitch of said grooves during the rotation of said inner member whereby a spring formed from said strand emerges from said outer member on said inner member at an end of said outer member opposite that at which said inner strand was entrained into said outer member.

4,434,122
POLYMER STABILIZATION

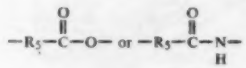
Jerry O. Reed; Ronald D. Mathis both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 11, 1982, Ser. No. 377,233
Int. Cl.³ C08K 100/00
U.S. Cl. 264—211 12 Claims

1. In a process for producing fiber by melt extruding a poly(arylene sulfide) resin having a melt flow of about 50 to about 400, the improvement for reducing gel formation during melt extrusion which comprises incorporating into said resin an effective heat and melt flow stabilizing amount of at least one phenolic amide or ester-based stabilizer having the formula:



where R_1 and R_2 can be an alkyl radical having from 1 to about 6 carbon atoms and R_1 and R_2 can be the same or different radicals; R_3 can be represented by the structure



where R_5 can be any alkylene or alkylidene radical having 1 to about 6 carbon atoms, R_4 can be R_5 or any alkyl radical having 1 to about 20 carbon atoms, and n is 1 when R_4 is an alkyl radical having 1 to about 20 carbon atoms, or n is 2 when R_4 is R_5 which amount is sufficient to retard curing and cross-linking of said resin during melt extrusion and thereby minimize plugging of filters and spinnerets with gel.

4,434,123
METHOD FOR THE PREPARATION OF AN ELECTRIC CONNECTOR

Horiko Katumi, and Noma Hideyuki, both of Saitama, Japan, assignors to Shin-Etsu Polymer Co., Ltd., Tokyo, Japan

Filed Jun. 5, 1981, Ser. No. 270,898
Claims priority, application Japan, Jun. 16, 1980, 55-81150; Jun. 16, 1980, 55-81151
Int. Cl.³ B32B 3/26
U.S. Cl. 264—225 6 Claims

1. A method for the preparation of an electrical connector formed of a core rod made of an electrically insulating elastic material and a plurality of annular zones made of a layer of an electrically conductive material adhesively bonded stripe-like around the surface of the core rod which comprises the steps of:

(a) continuously introducing a strip of film bearing releasable strips of a layer of a conductive material into a tubular mold at a first open end contacting and covering the inner surface of the tubular mold with the striped layer of the conductive material facing inwardly in such a manner that each of the stripes of the layer of conductive material takes the configuration of a substantially closed ring with simultaneous continuous discharge of the film out of the second open end;

(b) contacting the striped layer of conductive material borne by the film covering the inner surface of the tubular mold with the surface of an electrically insulating core of an elastic rubber continuously introduced into the tubular mold at the first open end to fill the space surrounded by the stripe of film with simultaneous continuous discharge at the second open end at such a velocity that the striped layer of the conductive material borne by the film is released onto the surface of the core when the core and the film are discharged out of the tubular mold;

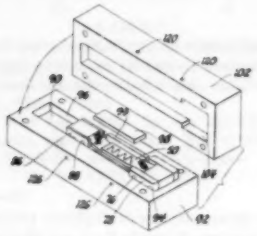
(c) removing the core rod and the film together as discharged out of the tubular mold; and

(d) removing the film from the surface of the core to release the striped annular zones of conductive material transferred and adhesively bonded to the surface of the core.

4,434,124
METHOD FOR MAKING A RESILIENT TIE-DOWN DEVICE

Ralph F. Manteia, Union Lake, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 24, 1983, Ser. No. 469,255
Int. Cl.³ B29C *6/00*; B29D *3/02*; B29H *3/00*
U.S. Cl. 264—229 **3 Claims**

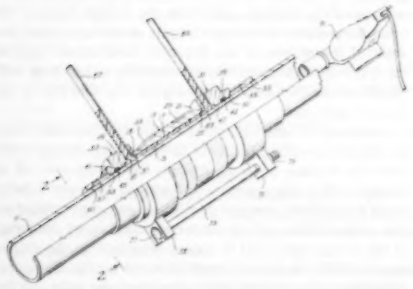


1. A method of making a resilient tie-down device for a restraint system which serves to secure a vehicle to the support platform of a transporter, said method comprising the steps of providing a strap made of a woven material, providing a loop portion at each end of the strap, placing said strap in a mold, connecting one loop portion of said strap to a fixed support member in said mold and connecting the other loop portion of said strap to a movable support member in said mold, closing said mold and injecting elastomeric material therein under pressure so as to cause said movable support member to move away from said fixed support member and place said strap in tension while in said mold, curing said elastomer while said strap is under tension and removing said strap from said mold after said elastomeric material has cured so that said pretensioned strap maintains said elastomeric material in compression.

4,434,125
METHOD FOR SECURING A WEAR SLEEVE ABOUT A DRILL PIPE

Gerry R. Lavender, and James O. Chance, Jr., both of Houston, Tex., assignors to Smith International, Inc., Newport Beach, Calif.

Filed Mar. 12, 1982, Ser. No. 357,782
Int. Cl.³ B29C *5/00*
U.S. Cl. 264—262 **15 Claims**



1. Method of securing a metallic wear sleeve about a metallic drill pipe tube comprising:

positioning the sleeve concentrically about the tube forming an annulus therebetween,

sealing the ends of the annulus,

filling the annulus with liquid exothermically polymerically setting adhesive plastics material, which is at ambient room temperature when introduced, and

allowing the plastics material to heat up and set gradually from the interior to the exterior of the annulus while introducing additional cooler liquid adhesive plastics material to the annulus to make up for setting shrinkage of the thermoset plastics material already in the annulus.

4,434,126
POWDER COATING PROCESS FOR FORMING SOFT FLEXIBLE POLYURETHANE FILM

Charles W. McGary, Jr., Centerville; Vincent J. Pascarella, Dayton; Robert A. Taller; Delmer R. Rhodes, both of Centerville; Paul E. Anglin, Dayton, and Charles W. Daugherty, Xenia, all of Ohio, assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Mar. 15, 1982, Ser. No. 357,915
Int. Cl.³ B29C *13/00*
U.S. Cl. 264—303 **20 Claims**

1. A process for forming a soft, flexible polyurethane film which consists essentially of:

(a) fluidizing finely divided particles of a polyurethane prepolymer, said prepolymer having a crystalline melt point in the range of approximately 10° to 45° C.,

(b) pre-heating a film form to a temperature at which said particles will adhere to said form when in contact therewith,

(c) immersing said pre-heated form into said fluidized particles such that said particles deposit on said form,

(d) heating said form to melt said particles such that said particles flow out into a thin, continuous, essentially pin hole free film, and

(e) removing said film from said form;

wherein said prepolymer comprises the reaction product of an organic polyisocyanate, a crystalline long chain diol having an average molecular weight of approximately 500 to 5000, a polyhydroxy crosslinking agent and an end blocking agent, wherein the resulting polyurethane elastomer has a 100% modulus less than approximately 250 psi and a 300% modulus between 200 and 500 psi.

4,434,127
HEAT CURABLE POLYDIORGANOSILOXANE COMPOSITIONS HAVING ENHANCED RELEASE UPON CURE

Madhu Baile, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Dec. 9, 1982, Ser. No. 448,140
Int. Cl.³ B29C *25/00*
U.S. Cl. 264—236 **16 Claims**

13. A method of improving the release of organic peroxide cured silicone rubber from metal molds, said method comprising,

(i) mixing with 100 parts by weight of an organic peroxide containing polydiorganosiloxane composition from 0.05 parts by weight to 0.3 parts by weight of a polydiorganosiloxane fluid having the formula $Me_3SiO(MeQSiO)_x(MeSiO)_ySiMe_3$, wherein Me represents the methy radical, Q represents a carboxyfunctional radical bonded to the silicon atom by an Si—C bond, x has an average value of from 1% to 5% of the value of y, and the average value of the sum of the values of x and y is from about 100 to about 800;

(ii) placing the mixture from (i) in a metal mold,

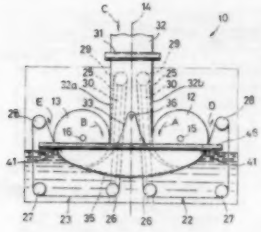
(iii) subjecting the mixture in the metal mold to heat for an amount of time sufficient to cure said molded mixture, and,

(iv) removing the cured silicone rubber from the mold.

4,434,128
METHOD AND APPARATUS FOR STRETCHING THERMOPLASTIC POLYMER FILMS

Tokio Okada; Shigezo Kojima; Haruhisa Tani; Kazuhiko Kurihara, all of Tokyo, and Hiroshi Yazawa, Kunitachi, all of Japan, assignors to Nippon Petrochemicals Co., Ltd and Polymer Processing Research Institute, Ltd., both of Tokyo, Japan

Filed Mar. 29, 1982, Ser. No. 362,844
Claims priority, application Japan, Apr. 1, 1981, 56-48797
Int. Cl.³ B29D 7/24
U.S. Cl. 264—560 5 Claims



1. In a method of stretching a thermoplastic polymer film, comprising:
(a) feeding the film in a longitudinal direction;
(b) gripping the film along its opposite selvages;
(c) moving the gripped selvages respectively along a pair of divergent arcuate paths lying substantially in the same plane and each extending over a predetermined circumferential range of from approximately a quarter to approximately a half of the full circumference of a circle containing the arcuate path, whereby the film is reversed in its direction of travel while being stretched; and
(d) heating the film during its stretching; the improvement which comprises:
(e) moving, a central web portion of the film between the gripped selvages, over a convex guide surface at the position where the film is reversed in its direction of travel, the convex guide surface having a radius of curvature capable of maintaining the amount of longitudinal movement of the film substantially constant across its width; and
(f) providing a layer of a pressurized heating medium between the central web portion and the convex guide surface.

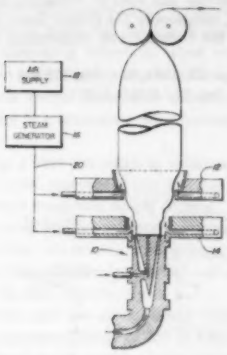
4,434,129
METHOD AND APPARATUS FOR COOLING MOLTEN TUBE

Ajit Bose, Rexdale, Canada, assignor to Leco Inc., Rexdale, Canada

Filed Mar. 29, 1982, Ser. No. 363,280
Int. Cl.³ B29F 3/08
U.S. Cl. 264—557 13 Claims

1. In a method of convection cooling a molten extruded tube produced by a blown-tube process, the improvement comprising cooling said tube by convection by utilizing the heat of evaporation of moisture in steam by bringing said steam into contact with the exterior surface of said molten tube after extrusion of the molten tube from an extrusion die, said steam being permitted to expand prior to, during or subsequent to contact with said molten tube, whereby the latent heat of evaporation cools said molten tube.

8. An apparatus for convection cooling an extruded molten tube comprising air ring means adapted to surround a molten extruded tube produced by a blown-tube process in which a molten tube is extruded from an extrusion die, steam generating means for generating a source of steam, means for operatively associating said steam generating means with said air ring means to feed a stream of steam into said air ring means, said air ring means comprising means for dispensing an annular flow of steam surrounding the exterior surface of said molten extruded tube and for permitting said steam to expand prior to, during, or subsequent to contact with said molten tube,

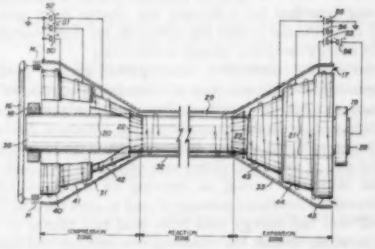


whereby said steam is effective to cool said molten tube by convection cooling utilizing the heat of evaporation of said steam.

4,434,130
ELECTRON SPACE CHARGE CHANNELING FOR FOCUSING ION BEAMS

Winfield W. Salisbury, Scottsdale, Ariz., assignor to Energy Profiles, Inc., Newtown Square, Pa.

Filed Nov. 3, 1980, Ser. No. 203,134
Int. Cl.³ G21B 1/02
U.S. Cl. 376—107 16 Claims



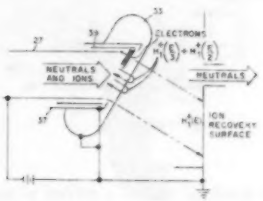
1. In a fusion reactor, the combination comprising:
(a) means including coaxial electrodes spaced apart to establish an annular reaction zone with a voltage thereacross to establish a spiral beam of electrons traveling along a common spiral path through an annular reaction zone free from any applied magnetic field to form a cylindrical electron sheath which rotates as a whole about a common sheath axis; and
(b) means to project oppositely directed beams of fusible ions longitudinally through said electron sheath to force ions in both ion beams into linear paths in a common thin cylindrical zone located where the potential gradient in electron sheath is minimum.

4,434,131

NEUTRAL BEAMLINE WITH IMPROVED ION ENERGY RECOVERY

William K. Dagenhart, Oak Ridge; Halsey H. Haselton, Knoxville; William L. Stirling, and John H. Whealton, both of Oak Ridge, all of Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 13, 1981, Ser. No. 253,641
Int. Cl.³ G21B *1/00*
U.S. Cl. 376—130 **5 Claims**



1. In a neutral particle beam injector system wherein a neutral particle beam is generated and directed along a beamline, including a substantially ground-potential-operated ion source from which ions of a selected isotopic species are accelerated to a desired kinetic energy level along said beamline through a neutralizer, said neutralizer being operated at a selected ion acceleration potential relative to said ion source to provide said desired kinetic energy level and wherein a significant portion of said ions are converted into energetic neutral particles together with electrons, full kinetic energy atomic ions and fractional kinetic energy atomic ions derived from molecular ions of said selected species accelerated into said neutralizer, an ion energy recovery system including a magnetic field generating means for producing a magnetic field (B) transverse to said beamline in a beam exit region at the beam exit end of said neutralizer and of sufficient strength to substantially block electrons from exiting said neutralizer and deflecting said full energy ions from said beamline along a separate path, and at least one ground potential full energy ion charge collector surface disposed in the path of said full energy ions deflected from said beamline for collecting the charge from said full energy ions directed to said ion collector, the improvement in said ion energy recovery system comprising;

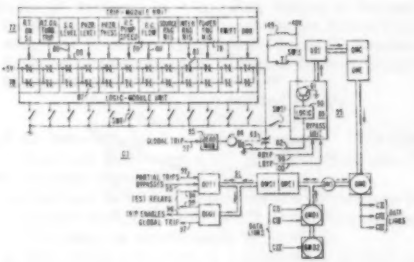
an electrically conductive, nonmagnetic, ground potential operated box-like structure surrounding a portion of said beam exit end of said neutralizer and insulatably spaced from said neutralizer, said box-like structure having a downstream end surface disposed transverse to said beam exit end of said neutralizer, said end surface of said box-like structure having an opening in a central region thereof for restricted passage of said neutral particle beam and said full energy ions from said exit region of said neutralizer so that the rmaining downstream end surface of said box-like structure produces a strong electric field gradient (E_f) in conjunction with the accelerating voltage applied to said neutralizer which is transverse to said magnetic field (B), thereby forcing said fractional energy ions to be deflected back into said neutralizer and forcing any electrons in said beam exit region between said neutralizer and said end surface of said box-like structure to drift in a direction perpendicular to said electric field (E_f) and said magnetic field (B) within said box-like structure; and an electron collector disposed within said box-like structure, said electron collector surrounding and extending past said exit end of said neutralizer into the drift path of said electrons, said electron collector being disposed in an insulatably spaced relation to said neutralizer and said box-like structure and biased sufficiently positive with respect to said neutralizer to collect said electrons forced to drift toward said electron collector.

4,434,132

POWER SUPPLY WITH NUCLEAR REACTOR

Bruce M. Cook, Pittsburgh, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 9, 1981, Ser. No. 252,515
Int. Cl.³ G21C *17/00*
U.S. Cl. 376—259 **32 Claims**



5. Power supply apparatus including a nuclear reactor and components, cooperative with said reactor, for converting the thermal-energy generated by said reactor into electrical power, said reactor and said components having a plurality of processes, each process having one or more parameters to be monitored, means, connected to said reactor, when actuated, tripping said reactor, a plurality of monitoring channels for said parameters, each of said channels having a plurality of sensors, each sensor herein called a local sensor, each of said local sensors being connected to said reactor and/or to said components, for sensing a different one of said parameters, first impressing means, connecting to each of said channels, the like sensors, herein called remote sensors, of the other channels, to impress their sensed signals in said each channel, bypassing means in each channel, cooperative with each local sensor of said channel, for bypassing said each local sensor when said local sensor is subject to test or maintenance or is defective or disabled or the like, impressing means in each channel for impressing, in each of the other channels, intelligence of a bypass of a sensor in said last-named each other channel, said bypass being herein referred to as a remote bypass with respect to said each of said other channels, means, connected to said tripping means, and responsive to the sensing of an off-normal parameter by unbypassed local sensor of a channel and an unbypassed remote sensor of the same set in the same channel for actuating said tripping means to trip said reactor, and means, responsive to the bypassing by said first bypassing means of a local sensor of a channel and to intelligence impressed by said impressing means in said channel of the bypass of a remote sensor of the same set as said local sensor for only conditioning said reactor to be tripped.

4,434,133

SYSTEM FOR THE PRODUCTION OF KETENE AND METHYLENE FROM CARBONATE MINERALS

Michael G. Down, Plum Borough; D. Colin Phillips, Monroeville, and Werner S. Emmerich, Churchill Borough, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 26, 1981, Ser. No. 266,671
Int. Cl.³ G21C *15/00*
U.S. Cl. 376—323 **14 Claims**

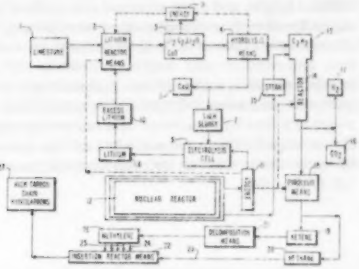
6. A process of converting inorganic carbonate mineral material to organic high carbon chain hydrocarbon material, utilizing nuclear reactor energy, comprising the steps of:

(1) reacting inorganic carbonate mineral material with a stoichiometric excess of molten lithium metal, at a temper-

ature over about 300° C. in the absence of air and moisture, to produce a product mixture comprising lithium salts Li_2C_2 and Li_2O, and then

(2) hydrolyzing the lithium salts produced in step (1), to produce C_2H_2, and then

(3) catalytically reacting the C_2H_2 produced in step (2), with steam, in the presence of zinc containing catalyst, at between about 250° C. and about 475° C., in a manner effective to provide gases which upon condensation yield CH_3COCH_3, without producing benzene, and then



(4) pyrolyzing the CH_3COCH_3 produced in step (3), at between about 600° C. and about 800° C., to provide ketene and methane, and then

(5) separting ketene from methane, and then

(6) decomposing the ketene to provide methylene, and then

(7) reacting the methylene with an alkane material, to provide a product which is reacted with additional methylene in a manner effective to cause methylene insertion chain reactions and provide hydrocarbon materials containing at least three carbon atoms; where at least a part of the heat energy required for the pyrolyzing step of step (4) is supplied from a nuclear reactor.

4,434,134

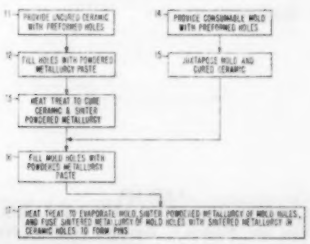
PINNED CERAMIC SUBSTRATE

Russell E. Darrow, Endicott; Joseph Funari, Vestal; George S. Kotrch, Endicott, and George C. Phillips, Endwell, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 10, 1981, Ser. No. 252,748

Int. Cl.³ B22F 3/00

U.S. Cl. 419—5 **7 Claims**



1. A method for making a pinned ceramic substrate having plural pins outwardly extending from at least one predetermined surface thereof, said method comprising the steps of:

providing a ceramic substrate having a plurality of first holes to be pinned, said first holes inwardly extending from a predetermined first surface of said substrate,

filling said first holes with unsintered powdered metal particles in a temporary non-elastomer paste-like binder,

providing a vaporizable carrier having a corresponding plurality of second holes inwardly extending from a predetermined second surface thereof,

juxtaposing said first and second surfaces in a predetermined contacting relationship with each other, each one of said first holes being paired with a mutually exclusive one of said second holes and being in a predetermined registration relationship therewith when said first and second surfaces are in said predetermined contacting relationship,

filling said second holes with unsintered powdered metal particles in a temporary non-elastomer paste-like binder, and

providing a heat treatment to sinter said unsintered powdered metal particles of said first and second holes and to evaporate away said binder thereof,

whereby said powdered metal particles in each one of said paired first and second holes is fused to form one of said pins affixed to said substrate and said carrier is evaporated away by said heat treatment,

said binders and said carrier being evaporated away within the temperature range of 250 to 400 degrees C., and said powdered metal particles being sintered at a temperature greater than 400 degrees C., and said ceramic substrate and said powdered metal particles having compatible shrinkage characteristics, and said ceramic substrate and said powdered metal particles having compatible firing and sintering temperatures, respectively.

3. A method for making a pinned ceramic substrate having plural pins outwardly extending from at least one predetermined surface thereof, said method comprising the steps of:

providing a ceramic substrate having a plurality of first holes to be pinned, said first holes inwardly extending from a predetermined first surface of said substrate,

filling said first holes with unsintered powdered metal particles in a temporary non-elastomer paste-like binder,

providing a first heat treatment to sinter said unsintered powdered metal particles of said first holes and to evaporate said binder thereof,

providing a vaporizable carrier having a corresponding plurality of second holes inwardly extending from a predetermined second surface thereof,

juxtaposing said first and second surfaces in a predetermined contacting relationship with each other, each one of said first holes being paired with a mutually exclusive one of said second holes and being in a predetermined registration relationship therewith when said first and second surfaces are in said predetermined contacting relationship,

filling said second holes with unsintered powdered metal particles in a temporary non-elastomer paste-like binder, and

providing a second heat treatment to sinter said unsintered powdered metal particles of said second holes and to evaporate said binder thereof, whereby said powdered metal particles in each one of said paired first and second holes is fused to form one of said pins affixed to said substrate and said carrier is evaporated away by said second heat treatment,

said binders and said carrier being evaporated away within the temperature range of 250 to 400 degrees C., and said powdered metal particles being sintered at a temperature greater than 400 degrees C., and said ceramic substrate and said powdered metal particles having compatible shrinkage characteristics, and said ceramic substrate and said powdered metal particles having compatible firing and sintering temperatures, respectively.

4,434,135

GAS BLACK BURNER

Peter Kleinschmit; Manfred Voll, both of Hanau, and Richard Engel, Bernheim-Waldof, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 171,204, Jul. 22, 1980, abandoned. This application Feb. 26, 1982, Ser. No. 352,616

Claims priority, application Fed. Rep. of Germany, Aug. 7, 1979, 2931907

Int. Cl.³ C09C *1/48*

U.S. Cl. 422—150 4 Claims

1. A burner for producing gas black comprising a pipe shaped chamber with circular cross-section provided with at least one means for supplying the operation gas containing the raw material for the carbon black, and a cooled deposition surface, the wall of said chamber having slit shaped openings disposed in parallel to one another and at mutually uniform distances in said wall for discharging said gas into the surrounding air and establishing a carbon black forming diffusion flame, there being present 3 to 8 slits per meter of chamber length, each of said slits at room temperature having a width of 0.4 to 1 mm, the slits being directed against said cooled deposition surface, and the length of each slit shaped opening ranging from 1:36 to 1:2 with respect to the circumference of said chamber, said pipe shaped chamber being formed of a scale resistant material.

4,434,136

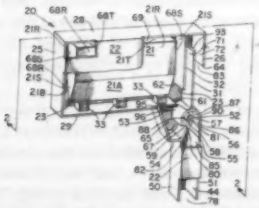
TAPERED-BOTTOM BLEACH CAKE FOR SANITATION DOSING DISPENSER

Randolph N. Wilkinson, III; Elmore C. Sneed, both of Cincinnati, and Janet M. Mueller, Miamisburg, all of Ohio, assignors to The Proctor & Gamble Company, Cincinnati, Ohio

Filed Mar. 8, 1982, Ser. No. 355,983

Int. Cl.³ B01D *11/02*

U.S. Cl. 422—263 7 Claims



1. A toilet tank dosing dispenser containing a solid cake of water-soluble calcium hypochlorite within a reservoir cake compartment, said dispenser including means for allowing a dose volume of water to be routed through said reservoir with each dispensing cycle and means for immersing a lowermost portion of the cake to a predetermined depth in said water to facilitate dissolving a portion of said cake for dispensing at a later time; wherein said water level drops below said cake with each dose;

characterized in that:

said cake being substantially completely water-soluble and having a geometric form that is of nonuniform cross-sectional area, as measured along at least a portion of its vertical height, said cross-sectional area generally increasing in the direction of increased vertical height, whereby the amount of cross-sectional area of said lowermost portion immersed in said water increases as said vertical height decreases, said cake and said reservoir cake compartment containing sufficient free space to allow the cake to gravity feed by dissolution into said water; said dosing dispenser providing a substantially uniform concentration of hypochlorite solution for each dispensing cycle for the life of the cake.

4,434,137

METHOD FOR DISSOLVING HARD-TO DISSOLVE NUCLEAR FUELS

Wolfgang Stoll, Hanau, and Wilhelm Ledebrink, Maintal, both of Fed. Rep. of Germany, assignors to Alkem GmbH, Hanau, Fed. Rep. of Germany

Filed Dec. 3, 1980, Ser. No. 212,453

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1979, 2951510

Int. Cl.³ C01G *56/00*; C01F *15/00*

U.S. Cl. 423—6 5 Claims

1. Method for dissolving hard-to-dissolve nuclear fuels selected from the group consisting of ThO_2 and PuO_2 in a nitric acid fission material solution containing fluoride ions, which comprises adding hard-to-dissolve nuclear fuel to a nitric acid fission material solution to dissolve the nuclear fuel in which said solution contains nitric acid and a fluoride complex selected from the group consisting of a U-fluoride complex and a Pu-fluoride complex to provide free fluoride ions in a small catalytically active amount due to small dissociation of fluoride ions from said fluoride complex.

4,434,138

ION EXCHANGE RESINS FOR URANIUM RECOVERY

John M. Lee, and William C. Bauman, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Oct. 2, 1981, Ser. No. 307,825

Int. Cl.³ C01G *43/00*; B01J *39/20, 41/14*

U.S. Cl. 423—7 15 Claims

1. A resin composite comprising macroporous particles of ion exchange resin having post-deposited therein at least one hydrous metal oxide selected from the group comprising titania hydrate, zirconia hydrate, hydrated titanium phosphate, and hydrated zirconium phosphate.

4,434,139

METHOD FOR REMOVING ADHERING OR DUST-LIKE DEPOSITS IN SYSTEMS HANDLING URANIUM HEXAFLUORIDE

Walter Bacher, Stutensee, and Eberhard Jacob, Feldafing, both of Fed. Rep. of Germany, assignors to Kernforschungszentrum Karlsruhe GmbH, Karlsruhe and Maschinenfabrik Augsburg-Nürnberg AG, Munich, both of, Fed. Rep. of Germany

Filed Mar. 10, 1981, Ser. No. 242,252

Claims priority, application Fed. Rep. of Germany, Mar. 14, 1980, 3009933

Int. Cl.³ C01G *43/06*

U.S. Cl. 423—19 6 Claims

1. A process for removing adhering or dust-like deposits in an apparatus which handles uranium hexafluoride, comprising the steps of :

(a) reacting said deposits with a gaseous boron halogenide other than boron trifluoride, to form at least one uranium halogenide; and

(b) reacting said at least one uranium halogenide with a fluorine-containing substance to form uranium hexafluoride.

4,434,140

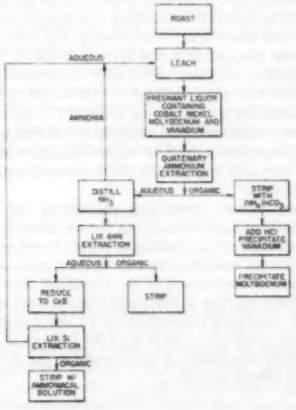
STRIPPING A SOLUTION CONTAINING MOLYBDENUM AND VANADIUM VALUES

Gale L. Hubred, Richmond, and Dean A. Van Leirsburg, Petaluma, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Sep. 24, 1982, Ser. No. 422,814

Int. Cl.³ C01G *39/00, 31/00*

U.S. Cl. 423—54 4 Claims



1. A method of stripping an organic extraction solvent containing molybdenum and vanadium quaternary alkyl ammonium complexes comprising:

contacting said organic extraction solvent with an aqueous stripping solution maintained at a temperature of no more than 50° C., a pH of between 7 and 9, and containing at least 75 grams per liter of a salt of a bicarbonate ion, for a time sufficient to convert said molybdenum and vanadium quaternary alkyl ammonium complexes to aqueous soluble metal complexes;

separating said organic extraction solvent and said aqueous stripping solution.

4,434,141

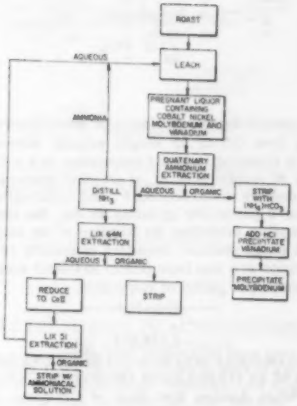
RECOVERY OF COBALT, MOLYBDENUM, NICKEL AND VANADIUM FROM AN AQUEOUS AMMONIA AND AMMONIUM SALT SOLUTION BY COEXTRACTING MOLYBDENUM AND VANADIUM AND SEQUENTIAL EXTRACTION OF NICKEL AND COBALT

Gale L. Hubred, Richmond, and Dean A. Van Leirsburg, Petaluma, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Sep. 24, 1982, Ser. No. 422,987

Int. Cl.³ C01G *39/00, 41/00, 51/00, 31/00*

U.S. Cl. 423—54 4 Claims



1. A process for separating the metal values in a pregnant liquor from an ammoniacal ammonium aqueous leach solution containing:

(i) at least one metal value selected from the group consisting of cobalt and nickel; and

(ii) at least one metal value selected from the group consisting of vanadium and molybdenum;

comprising the steps of:

(a) transferring said molybdenum and vanadium metal values from said pregnant liquor into a first organic solution by means of a first organic liquid extractant comprising a quaternary ammonium compound;

(b) stripping said first organic solution with a first aqueous ammonium bicarbonate stripping solution to form an aqueous solution containing said molybdenum and vanadium metal values;

(c) transferring nickel metal values from said pregnant liquor into a second organic solution by means of an organic nickel extractant comprising an oxime;

(d) reducing cobalt metal values in said pregnant liquor to divalent cobalt;

(e) transferring cobalt metal values from said pregnant liquor into a third organic solution by means of an organic cobalt extractant comprising a beta-diketone; and

(f) stripping each of said second and third organic solutions with aqueous stripping solutions to form a cobalt-containing aqueous solution and a nickel-containing aqueous solution.

4,434,142

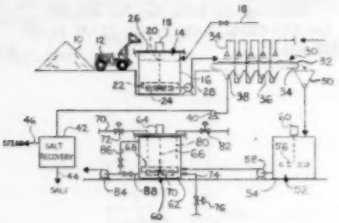
METHOD FOR TREATMENT OF ALUMINUM DROSS OXIDES

John A. Huckabay, Beaverton, Oreg., assignor to Imperial West Chemical Company, Reno, Nev.

Filed Sep. 28, 1982, Ser. No. 426,200

Int. Cl.³ C01F *7/02*

U.S. Cl. 423—111 **13 Claims**



1. In a method for the treatment of dross aluminum oxides containing from 0.5 to 25 weight percent aluminum metal particles by digestion in water suspension at a solids content from 30 to 80 weight percent, at elevated temperatures from about 175 degrees to 220 degrees F., and under agitation in the presence of a particulate grinding media, the improvement which comprises inhibiting the foaming of the suspension by injecting a purge medium consisting essentially of a gas into said suspension at a rate from 0.0025 to 0.0063 standard cubic feet per minute per gallon of suspension.

4,434,143

CARBONATE ION CONTROL TO PREVENT LOSSES OF VANADIUM IN OXIDATION OF HYDROGEN SULFIDE

Guenter Weber, Linden, Fed. Rep. of Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Aug. 10, 1982, Ser. No. 406,802

Claims priority, application Fed. Rep. of Germany, May 26, 1982, 3219825

Int. Cl.³ B01D *53/34;* C01B *17/05*

U.S. Cl. 423—226 **5 Claims**

1. In a process for the removal of H_2S from a gaseous mixture comprising:

(a) scrubbing said gaseous mixture with an aqueous alkaline scrubbing agent consisting essentially of five-valent vanadium and anthraquinone disulfonic acid, the absorbed hydrogen sulfide being oxidized to elemental sulfur while five-valent vanadium is reduced to four-valent vanadium; and

(b) the reduced scrubbing agent is subsequently regenerated for reuse by exposure to an oxygen-containing gas for the reoxidation of the four-valent vanadium,

the improvement which comprises adding and maintaining sufficient CO_3^{--} in the scrubbing agent to prevent precipitation of vanadium values.

4,434,144

ABSORPTION OF CO_2 AND/OR H_2S UTILIZING SOLUTIONS CONTAINING TWO DIFFERENT ACTIVATORS

Giuseppe Giammarco, and Paolo Giammarco, both of San Marco 3242, Palazzo Morolin, Venezia, Italy

Continuation of Ser. No. 91,920, Nov. 7, 1981, abandoned. This application Oct. 9, 1981, Ser. No. 310,256

Claims priority, application Italy, Nov. 16, 1978, 69613 A/78

Int. Cl.³ B01D *53/34, 53/36*

U.S. Cl. 423—223 **11 Claims**

1. A process for removing CO_2 and H_2S from a gaseous mixture by means of an absorbing solution, comprising:

circulating said solution between an absorption stage and a regeneration stage at an elevated temperature, said solution containing a prevailing concentration of a basic substance which essentially effects absorption of CO_2 and H_2S quantitatively, and an activating substance which absorbs CO_2 with greater activity than said basic substance thereby improving absorption efficiency and facilitating CO_2 passage from gaseous phase to liquid phase and back, said absorbing solution containing two different activating substances capable of increasing absorption efficiency of said solution in different and complementary ways, said solution comprising:

(a) a first activating substance consisting of glycine which absorbs CO_2 with the formation of a carbamate, at a higher rate than other components in said solution, facilitating CO_2 passage into liquid phase;

(b) a second activating substance consisting of As_2O_3 in an amount of 0.25 moles or less per mole of said first activating substance which essentially enhances decomposition and hydrolysis of said carbamate, thus regenerating said first activating substance (a); and

(c) an alkali metal carbonate which essentially effects said quantitative absorption of CO_2 introduced by said activating substances (a) and (b).

4,434,145

SIMULTANEOUS SCRUBBING AND OXIDATION OF HYDROGEN SULFIDE USING EXCESS VANADATE

Guenter Weber, Linden, Fed. Rep. of Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Aug. 10, 1982, Ser. No. 406,806

Claims priority, application Fed. Rep. of Germany, Apr. 30, 1982, 3216158

Int. Cl.³ B01D *53/34;* C01B *17/05*

U.S. Cl. 423—226 **4 Claims**

1. In a process for the removal of hydrogen sulfide from a gaseous mixture comprising:

(a) scrubbing said gaseous mixture with an aqueous alkaline scrubbing solution containing anthraquinone disulfonic acid and five-valent vanadium as the oxidizing agent, whereby the sulfide of the hydrogen sulfide is converted into higher oxidation states with simultaneous reduction of the five-valent vanadium to four-valent vanadium; and

(b) regenerating the scrubbing solution for reuse in a downstream oxidizer wherein an oxygen-containing gas incompletely reoxidizes the four-valent vanadium to five-valent vanadium, and wherein the pH in the scrubbing solution is less than 9.5,

the improvement comprising employing the five-valent vanadium in a ratio exceeding the stoichiometric ratio for the oxidation of the hydrogen sulfide based on the reduction of total vanadium by one valence state, and wherein the total concentration of the vanadium dissolved in the scrubbing solution is maintained larger than the stoichiometric vanadium concentration for the hydrogen sulfide loading to the extent of at least the content of four-valent vanadium remaining on reoxidation in the steady state of the scrubbing process.

4,434,146

SCRUBBING OF HYDROGEN SULPHIDE USING PH CONTROL TO CONTROL THIOSULFATE FORMATION

Guenter Weber, Linden, Fed. Rep. of Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Aug. 10, 1982, Ser. No. 406,807

Claims priority, application Fed. Rep. of Germany, Apr. 30, 1982, 3216160

Int. Cl.³ B01D *53/34;* C01B *17/05*

U.S. Cl. 423—226 **9 Claims**

1. In a process for the removal of hydrogen sulphide from a gaseous mixture comprising scrubbing said gaseous mixture with an aqueous alkaline scrubbing solution containing an oxidizing agent, whereby the hydrogen sulphide is absorbed

from the scrubbing solution and oxidized principally to sulphur with the formation of minor amounts of SO_4^{--} and $S_2O_3^{--}$, the improvement which comprises suppressing the formation of the $S_2O_3^{--}$ to less than 0.15 gram per liter of scrubbing solution per day, said suppressing being conducted by introducing sufficient amounts of CO_2 into the scrubbing solution to maintain a pH of the scrubbing solution in the range of 8.0 and not higher than 8.4.

4,434,147

SIMULTANEOUS SULFUR OXIDE AND NITROGEN OXIDE CONTROL IN FCC UNITS USING CRACKING CATALYST FINES WITH AMMONIA INJECTION

William L. Dimpfl, Oakland, and William A. Blanton, Woodacre, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 308,689, Oct. 5, 1981, abandoned. This application Jun. 10, 1982, Ser. No. 387,292

Int. Cl.³ C01B *21/00*; B01J *8/00*

U.S. Cl. 423—235 **7 Claims**

1. A process for lowering the amount of nitrogen oxides in a flue gas from a regenerator of a fluid catalytic cracking unit in which the circulating inventory of the unit contains at least a particulate cracking catalyst containing at least 20% alumina, a sulfur oxide sorbent, and a sulfur dioxide oxidation promoter, including the steps of:

(a) lowering the temperature of the flue gas to at least about 850° F.;

(b) mixing sufficient ammonia or an ammonia generating compound with the flue gas to achieve the desired reduction of said nitrogen oxide;

(c) passing the flue gas in the presence of oxygen through means for collecting and supporting cracking catalyst fines entrained in the flue gas; and

(d) controlling the temperature of the flue gas as it passes through said collecting and supporting means to between about 350° F. and about 850° F., whereby the nitrogen oxide in flue gas is reduced as it contacts the supported catalyst in the collecting and supporting means.

4,434,148

WORKING UP OF THE RESIDUAL GASES RESULTING FROM THE PRODUCTION OF CYANURIC CHLORIDE

Gerhard Bach, Frechen; Friedhelm Geiger, Erlensee; Werner Heimberger; Gerd Schreyer, both of Hanau, and Horst Hillenbrand, Wesseling, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

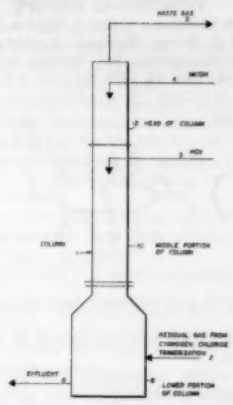
Filed Oct. 3, 1979, Ser. No. 81,555

Claims priority, application Fed. Rep. of Germany, Oct. 5, 1978, 2843383

Int. Cl.³ C01B *21/18*

U.S. Cl. 423—379 **8 Claims**

1. A process for working up the chlorine containing residual gases obtained in the production of cyanuric chloride by the trimerization of cyanogen chloride and consisting chiefly of unreacted cyanogen chloride, as well as chlorine, hydrogen chloride and inert gases comprising leading them into the lower portion of a column at 1–5 bar (absolute), reacting the gases in the column with at least the equivalent amount of hydrogen cyanide to form cyanogen chloride, charging water into the upper portion of the column, leading the cyanogen chloride formed in countercurrent flow to said water, and withdrawing an aqueous solution of cyanogen chloride from



the lower portion of the column and removing the purified waste gas from the upper portion of the column.

4,434,149

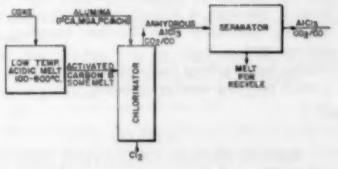
ACID MELT TREATMENT TO ACTIVATE CARBON FOR USE AS REDUCTANT

James C. Withers, and Raouf O. Loutfy, both of Tucson, Ariz., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Aug. 30, 1982, Ser. No. 412,926

Int. Cl.³ C01F *7/58*

U.S. Cl. 423—496 **19 Claims**



1. A method of activating a solid carbon reductant comprising introducing a solid carbon reductant into a liquid anhydrous acid melt consisting essentially of greater than 50 mole percent aluminum chloride and less than 50 mole percent of at least one other halide salt and separating the carbon solid from the acid melt.

9. A method of producing anhydrous aluminum chloride comprising:

(a) contacting a carbon solid selected from the group consisting of fully calcined coke and partially calcined coke with a liquid anhydrous acid melt comprising greater than 50 mole percent aluminum chloride and less than 50 mole percent of at least one other halide salt to activate said carbon solid for use as a reductant;

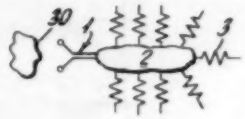
(b) separating the activated carbon solid from the acid melt;

(c) chlorinating aluminous material at a temperature of from about 550° C. to about 900° C. for a time period of from about 15 minutes to about 2 hours in the presence of a reductant comprising the activated carbon solid of step (b).

4,434,150
IMMUNOLOGICAL REAGENTS EMPLOYING POLYMERIC BACKBONE POSSESSING REACTIVE FUNCTIONAL GROUPS

A. R. M. Azad, Stoughton; Stefan J. Kirchanski, Framingham, and Michael C. Brown, Wayland, all of Mass., assignors to Ortho Diagnostic Systems, Inc., Raritan, N.J.

Filed Oct. 19, 1981, Ser. No. 313,019
Int. Cl.³ G01N *33/54;* A61K *43/00, 49/00*
U.S. Cl. 424—1.1 16 Claims



1. An immunological substance detecting reagent comprising:
(a) an immunological homolog specific for the substance to be detected;
(b) a water-soluble, substantially noncross-linked and nonprimary amine containing polymer having a net charge not greater than zero; and
(c) means for attaching substantially only one homolog to each water-soluble polymer.

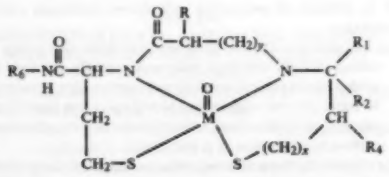
8. An immunological substance detecting reagent comprising:
(a) a first immunological homolog specific for the substance to be detected;
(b) a water-soluble, nonprimary amine containing and substantially noncross-linked polymer having a charge not greater than zero and selected from the group consisting of polyacrylic acid, polymethacrylic acid, polyacrylamide, polyvinylalcohol, polyallylalcohol, polymer combinations of the foregoing, hydroxyethyl cellulose, hydroxypropyl cellulose, natural water-soluble polymers and synthetic water-soluble polymers; and the polymer further having in association therewith a marker substance selected from the group consisting of nonfluorescent dyes, fluorescent dyes, radioisotopes, electron opaque substances, enzymes, a second immunological homolog of differing specificity than the first homolog and microspheres; and
(c) means for attaching substantially only one first homolog to each polymer-marker complex.

4,434,151
BIFUNCTIONAL CHELATING AGENTS

Edmund F. Byrne, Alameda, Calif., and Glen L. Tolman, Chelmsford, Mass., assignors to Medi-Physics, Inc., Emeryville, Calif.

Filed Nov. 8, 1982, Ser. No. 439,960
Int. Cl.³ A61K *43/00, 49/00*
U.S. Cl. 424—1.1 13 Claims

1. An anionic chelate of the formula:



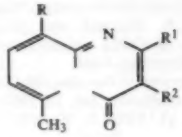
wherein R_6 is lower alkyl R_1 and R_2 are individually hydrogen or lower alkyl or taken together form oxo; M is a radioactive metal; R_4 is hydrogen or lower alkyl; x and y are integers from 0 to 2 or a salt of said anionic chelate.

4,434,152
TIME-RELEASE

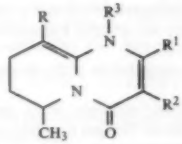
Tibor Horvath; Agnes Udvardy; Agoston David, all of Budapest, and Katalin Marmarosi nee Kellner, Biatorbagy, all of Hungary, assignors to CHINOIN Gyogyszer es Vegyeszeti Termekek Gyara Rt., Budapest, Hungary

Filed Apr. 26, 1982, Ser. No. 372,049
Claims priority, application Hungary, Apr. 28, 1981, 1092
Int. Cl.³ A61K *9/22, 9/24*
U.S. Cl. 424—19 12 Claims

1. A tablet or dragee core for a time-release pharmaceutical composition, suitable for oral administration, which comprises as active ingredient 50 to 70% by weight of a compound of the formula (I)



or the formula (Ia)



wherein
R is hydrogen or $—CH_2COOH$,
R^1 is hydrogen or alkyl having 1 to 4 carbon atoms,
R^2 is alkyl having 1 to 4 carbon atoms, alkoxycarbonyl having 2 to 5 carbon atoms, carbamoyl or ureido,
R^3 is hydrogen or methyl, and the dotted line stands for two hydrogens or another bond, or a pharmaceutically acceptable acid addit ion or quaternary ammonium salt thereof, and which further comprises by weight
1% colloidal silicic acid,
6.5% hydrophobic colloidal silicic acid,
7 to 12% fatty acid,
8 to 12% microcrystalline cellulose,
4 to 9% polyvinylpyrrolidone-vinyl acetate, and
0.5 to 4% of an acid stabilizer selected from the group consisting of betaine in hydrochloric acid tartaric acid and citric acid.

4,434,153
DRUG DELIVERY SYSTEM COMPRISING A RESERVOIR CONTAINING A PLURALITY OF TINY PILLS

John Urquhart, Palo Alto, and Felix Theeuwes, Los Altos, both of Calif., assignors to Alza Corporation, Palo Alto, Calif.

Filed Mar. 22, 1982, Ser. No. 360,477
Int. Cl.³ A61K *9/26, 9/28;* A61J *7/00*
U.S. Cl. 424—22 2 Claims

1. A device dimensioned and adapted for oral admittance into a gastro intestinal tract environment of use for extended residency into the fluid environment of the stomach as an in vivo resevoir for executing therein a therapeutic program over a prolonged period of time, the device comprising;
(a) a matrix formed of a pharmaceutically acceptable nontoxic, non-hydrated hydrogel that absorbs and imbibes fluid from the fluid environment of the stomach, expands

and swells exhibiting a 2 to 50 fold volume increase for retaining the device in the stomach over an extended period of time, said hydrogel being a hydrophilic hydrogel that is non cross-linked or a hydrophilic hydrogel cross-linked with acid mobile covalent or ionic bonds, said hydrophilic hydrogel selected from the group consisting of naturally occurring or synthetic polymeric materials and colloids;

(b) a plurality of tiny pills dispersed throughout the matrix, the tiny pills comprising:

(1) a core of beneficial drug; and,

(2) a wall formed of a drug release rate controlling fatty acid and wax wall composition that surrounds the core of beneficial drug, and,

(c) wherein, when the device is in the environment of use, the device executes the therapeutic program by delivering drug in the stomach for absorption in the stomach, and for passage into the intestine for absorption in the intestine.

4,434,154

TANNING AND ULTRA-VIOLET SCREENING COMPOSITION HAVING HIGH STABILITY

James E. McShane, Memphis, Tenn., assignor to Plough, Inc., Memphis, Tenn.

Continuation of Ser. No. 228,403, Jan. 26, 1981, abandoned. This application Apr. 23, 1982, Ser. No. 371,101

Int. Cl.³ A61K *7/44*

U.S. Cl. 424—60 **6 Claims**

1. A cosmetic composition capable of imparting artificial tan to human skin and of at least partially shielding the skin from ultra-violet rays comprising, based on the total weight of the composition:

(a) 2.5 to 7.5 percent dihydroxy acetone,

(b) 1.5 to 6 percent octyl dimethyl PABA,

(c) 80 to 95 percent water,

(d) 1 to 6 percent oil, and

(e) 0.1 to 1 percent surfactant,

said composition being an oil in water emulsion, stable after prolonged storage without developing disagreeable odor.

4,434,155

BASIC ALUMINUM BROMIDE COMPOSITIONS AND METHODS USEFUL AS ASTRINGENTS OR ANTI-PERSPIRANTS

John L. Jones, North Plainfield, and Andrew M. Rubino, New Providence, both of N.J., assignors to Armour Pharmaceutical Company, Phoenix, Ariz.

Filed Nov. 9, 1970, Ser. No. 88,206

Int. Cl.² A61K *7/38*

U.S. Cl. 424—47 **9 Claims**

1. A composition useful as an astringent or anti-perspirant comprising a non-toxic dermatologically acceptable nonaqueous solvent and at least five percent by weight of a basic aluminum bromide dissolved in the solvent, said basic aluminum bromide having units of the general formula:

$$Al_2(OH)_xBr_y \cdot XH_2O$$

wherein x may be from about 4.8 to 5.1 and y may be from about 0.9 to 1.2 such that $x+y=6$, and X may vary from about 2.0 to 3.4.

4,434,156

MONOCLONAL ANTIBODIES SPECIFIC FOR THE HUMAN TRANSFERRIN RECEPTOR GLYCOPROTEIN

Ian S. Trowbridge, San Diego, Calif., assignor to The Salk Institute for Biological Studies, San Diego, Calif.

Filed Oct. 26, 1981, Ser. No. 315,194

Int. Cl.³ C12N *5/02*; A61K *39/395*

U.S. Cl. 424—85 **16 Claims**

13. Rodent monoclonal antibodies specific for the transferrin binding site of human transferrin receptor glycoprotein and which block binding of transferrin to the receptor glycoprotein.

4,434,157

METHOD OF RECOVERING CELL ANTIGEN AND PREPARATION OF FELINE LEUKEMIA VACCINE THEREFROM

Richard G. Olsen, London, Ohio, assignor to The Ohio State University Research Foundation, Columbus, Ohio

Continuation-in-part of Ser. No. 104,789, Dec. 18, 1979, Pat. No. 4,332,793. This application Apr. 7, 1982, Ser. No. 366,352

Int. Cl.³ A61K *39/12*

U.S. Cl. 424—89 **13 Claims**

1. A method for recovering virus-free, cell-free Feline leukemia associated neoantigen from cells infected with Feline Leukemia virus, which comprises:

(a) culturing said cells in a serum-containing growth medium;

(b) transferring and maintaining said cultured cells in a serum-free medium under conditions and for a time adequate to accumulate said neoantigen shed from said cells in said serum-free medium;

(c) separating said cultured cells from the associated serum-free medium, thereby producing a cell-free, serum-free medium;

(d) reducing the volume of said cell-free, serum-free medium without substantial loss of said neoantigen therefrom, thereby producing a neoantigen-rich medium; and

(e) inhibiting protease enzymes in said neoantigen-rich medium.

5. The method of claim 1 or 3 wherein said concentration step (d) includes continuous-flow molecular filtration with a filter having an exclusion size of about 10,000 daltons to produce a neoantigen-containing retenate followed by freezing and lyophilization of said retenate.

12. The neoantigen concentrate produced by the method of claim 5.

4,434,158

CYSTEINE DELIVERY SYSTEM

Alton Meister, New York, and Joanne M. Williamson, Roosevelt Island, both of N.Y., assignors to Cornell Research Foundation, Ithaca, N.Y.

Division of Ser. No. 233,564, Feb. 11, 1981, Pat. No. 4,335,210. This application Apr. 15, 1982, Ser. No. 368,903

Int. Cl.³ A61K *37/54, 31/195, 31/425*

U.S. Cl. 424—94 **1 Claim**

1. Method for increasing the glutathione level of an in vivo system which comprises administering to the system L-2-oxothiazolidine-4-carboxylate and subjecting it to the action of 5-oxo-L-prolinase in the presence of adenosine triphosphate to produce S-carboxy cysteine, decarboxylating S-carboxy cysteine to produce cysteine and metabolizing the latter to glutathione.

4,434,159

PHARMACEUTICAL COMPOSITION FOR INTRARECTAL ADMINISTRATION, AND SUPPOSITORY PREPARED THEREFROM

Kunio Sekine; Yoshiki Suzuki, both of Hino; Gentaro Yamashita, Tachikawa, and Hisao Yamaguchi, Hino, all of Japan, assignors to Teijin Limited, Osaka, Japan

Filed Mar. 31, 1981, Ser. No. 249,462

Claims priority, application Japan, Mar. 31, 1980, 55-40368; Mar. 31, 1980, 55-40369

Int. Cl.³ A61K *37/26, 31/725, 31/70, 37/00*

U.S. Cl. 424—178 **15 Claims**

1. A pharmaceutical composition for intrarectal administration comprising a pharmaceutically effective amount of an active ingredient selected from the group consisting of peptide hormones and polysaccharides, which when administered alone to the rectum, is substantially unabsorbable into the

living body through the mucous membrane of the rectum, said composition further containing an absorption aid acting within the rectum in such a way as to induce absorption of said active ingredient through the rectal mucous membrane, said absorption aid being characterized by

(1) being substantially nontoxic to living organisms, and

(2) having a molecular weight of from about 100 to about 300, and being selected from the group consisting of ascorbic acid or a pharmaceutically acceptable salt thereof, salicylic acid, an ester thereof at its acidic hydroxyl group, or a pharmaceutically acceptable salt thereof at the carboxyl group and pyroglutamic acid, or a pharmaceutically acceptable salt thereof at the carboxyl group.

4,434,160

NUTRIENT SOLUTION FOR COMPLETE PARENTERAL FEEDING AND FOR INCREASED ENERGY PRODUCTION

Stojan Jeretin, Ljubljana, Yugoslavia; Karl Groke, Eggersdorf, and Horst E. Musil, Graz, both of Austria, assignors to Leopold & Co. Chem. Pharm. Fabrik Gesellschaft m.b.H., Graz, Austria

Filed Jul. 7, 1981, Ser. No. 281,050

Claims priority, application Fed. Rep. of Germany, Jul. 11, 1980, 3026368

Int. Cl.[3] **A61K** *31/70, 31/185, 31/205*

U.S. Cl. 424—180 **7 Claims**

1. An aqueous fat-free composition for the parenteral feeding and for the treatment of patients in the post-aggression phase in order to ensure an adequate supply of amino-acids consisting essentially of the following mixture:

(a) glucose or glucose substitutes selected from the group consisting of fructose and sugar alcohols or a mixture of glucose and said glucose substitutes in at least an amount exceeding the normal body's demand and up to 50 parts by weight;

(b) 0.8–1.2 parts by weight of L-carnitine as an inner salt or as a pharmaceutically tolerated acid addition salt; and

(c) 25 parts by weight of an amino acid mixture composed of the following amino acids:

0.8–1.05 parts by weight of L-isoleucine
1.4–1.5 parts by weight of L-leucine
1.4–1.65 parts by weight of L-lysine
0.5–1.2 parts by weight of L-methionine
1.25–1.4 parts by weight of L-phenylalanine
0.7–1.05 parts by weight of L-threonine
0.35–0.375 parts by weight of L-tryptophane
1.0–1.5 parts by weight of L-valine
2.0–2.8 parts by weight of L-arginine
1.0–1.5 parts by weight of L-histidine
3.5–4.0 parts by weight of L-alanine
0.35–0.55 parts by weight of L-aspartic acid
0.1 part by weight of L-cysteine
2.0–2.25 parts by weight of L-glutamic acid
1.5–2.3 parts by weight of glycine
0–0.625 part by weight of ornithine
2.2–2.8 parts by weight of L-proline
1.1–1.4 parts by weight of L-serine
0–1.5 parts by weight of L-tyrosine,

the amino acids L-tyrosine and L-cysteine being present in the solution in the form of their acyl derivatives.

4,434,161

SULFUR AND SILICON-CONTAINING FATTY ACID AMIDES

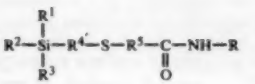
Sandor Barcza, Mt. Lakes, N.J., assignor to Sandoz, Inc., East Hanover, N.J.

Filed Sep. 29, 1982, Ser. No. 427,606

Int. Cl.[3] **C07F** *7/10*

U.S. Cl. 424—184 **15 Claims**

1. A compound of the formula:



I

wherein each of

R^1, R^2 and R^3 is, independently, alkyl having from 1 to 22 carbon atoms, alkenyl having from 2 to 22 carbon atoms, cycloalkyl having from 3 to 20 ring carbon atoms, aryl having from 6 to 14 aromatic ring carbon atoms, or aralkyl having from 6 to 14 aromatic ring carbon atoms and from 1 to 4 carbon atoms in the alkylene portion thereof; or

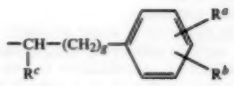
R^2 and R^3 may be joined to form together with the silicon atom a saturated sila-hydrocarbyl ring having from 4 to 20 ring members,

provided that the total number of carbon atoms in $R^1+R^2+R^3$, other than aromatic ring carbon atoms or substituents thereon, is not more than 35,

each of R^4 and R^5 is, independently, an alkylene chain having from 1 to 6 carbon atoms, or a cycloalkylene radical having from 3 to 6 ring carbon atoms;

said cycloalkyl and cycloalkylene radicals may bear from 1 to 4 lower alkyl groups having from 1 to 6 carbon atoms; said aryl radicals, or portions thereof, may bear 1 or 2 halo substituents, each having an atomic weight of from about 19 to 80, or from 1 to 3 lower alkyl or alkoxy radicals each having from 1 to 6 carbon atoms; and

R is of type (a) an aralkyl-type radical of the structure



(a)

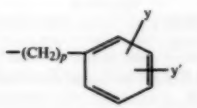
wherein

g is 0, 1 or 2;

R^a is a hydrogen atom, halo having an atomic weight of from about 19 to 127, alkoxy having from 1 to 4 carbon atoms, or alkyl having from 1 to 4 carbon atoms, or trifluoromethyl;

R^b is a hydrogen atom, alkyl having from 1 to 3 carbon atoms, alkoxy having from 1 to 3 carbon atoms, or halo having an atomic weight of from about 19 to 36; and

R^c is subtype (i) a hydrogen atom; subtype (ii) a radical of the structure



(ii)

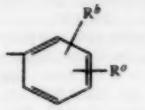
in which

p is 0, 1 or 2, and

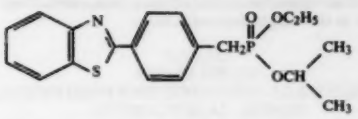
y is a hydrogen atom, halo having an atomic weight of from about 19 to 127, alkoxy having from 1 to 4 carbon atoms, or alkyl having from 1 to 4 carbon atoms; and

y' is a hydrogen atom, alkoxy having from 1 to 3 carbon atoms, alkyl having from 1 to 3 carbon atoms, or halo having an atomic weight of from about 19 to 36; or

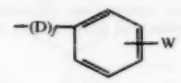
subtype (iii) alkyl having from 1 to 8 carbon atoms; or R is of type (b) a phenyl-type radical of the structure



(b)

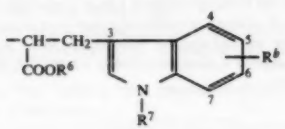


in which
R^b is as defined above, and
R^o is a hydrogen atom, halo having an atomic weight of from about 19 to 127, alkoxy having from 1 to 4 carbon atoms, or alkyl having from 1 to 4 carbon atoms; or
R^o is a radical of the structure R^f:



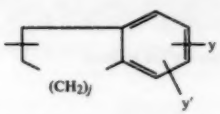
in which
D is $-CH_2-$ or $-O-$;
f is 0 or 1; and
W is a hydrogen atom, halo having an atomic weight of from about 19 to 80, alkoxy having from 1 to 3 carbon atoms, or alkyl having from 1 to 3 carbon atoms; or
R is of type (c) an indolyl radical of the structure:

(c)



wherein
R^b is as defined above;
R^6 is alkyl having from 1 to 8 carbon atoms or benzyl; and
R^7 is a hydrogen atom, alkyl having from 1 to 8 carbon atoms or benzyl; or
R is (d) a benzocycloalkyl nucleus of the structure:

(d)



wherein
y and y' are as defined above; and
j is a whole integer of from 1 to 4.

4,434,162

PHOSPHONIC ACID ESTER, PHARMACEUTICAL COMPOSITIONS CONTAINING THE SAME AND METHOD OF USING THE SAME

Goro Tsukamoto, Toyonaka; Toshihiko Kohno, Sakai; Koichiro Yoshino, Osaka; Tominori Morita, Nishinomiya; Keizo Ito, Osaka, and Takashi Nose, Nara, all of Japan, assignors to Kanebo, Ltd., Tokyo, Japan

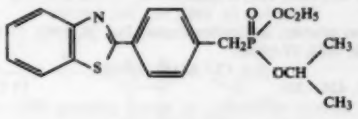
Continuation-in-part of Ser. No. 235,124, Feb. 17, 1981, abandoned. This application Apr. 7, 1982, Ser. No. 366,415

Int. Cl.³ C07D *277/66;* **A61K** *31/425*

U.S. Cl. 424—200 **3 Claims**

1. 4-(Benzothiazol-2-yl)benzylphosphonic acid ethyl isopropyl ester having the following formula:

2. A coronary vasodilating composition comprising a therapeutically effective amount of 4-(benzothiazol-2-yl)benzylphosphonic acid ethyl isopropyl ester having the following formula:



and a pharmaceutically acceptable carrier therefor.

4,434,163

WATER-SOLUBLE BENZOTHIAZINE DIOXIDE SALTS

Joseph G. Lombardino, Niantic, Conn., assignor to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 268,980, Jun. 1, 1981, abandoned. This application Apr. 13, 1982, Ser. No. 367,066

Int. Cl.³ C07D *401/12;* **A61K** *31/54*

U.S. Cl. 424—246 **5 Claims**

1. A water-soluble base salt of an acidic, anti-inflammatory 1,2-benzothiazine, said salt being a member selected from the group consisting of the lysine and arginine salts of N-(2-pyridyl)-2-methyl-4-hydroxy-2H-1,2-benzothiazine-3-carboxamide 1,1-dioxide.

5. A method for treating arthritic conditions in a warm-blooded animal, which comprises administering to said animal an effective anti-arthritic amount of a compound as claimed in claim 1.

4,434,164

CRYSTALLINE BENZOTHIAZINE DIOXIDE SALTS

Joseph G. Lombardino, Niantic, Conn., assignor to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 268,980, Jun. 1, 1981, abandoned. This application Apr. 13, 1982, Ser. No. 367,067

Int. Cl.³ C07D *401/12;* **A61K** *31/54*

U.S. Cl. 424—246 **8 Claims**

1. A water-soluble base salt of an acidic, anti-inflammatory 1,2-benzothiazine, said salt being a member selected from the group consisting of the ethylenediamine, monoethanolamine and diethanolamine salts of N-(2-pyridyl)-2-methyl-4-hydroxy-2H-1,2-benzothiazine-3-carboxamide 1,1-dioxide.

7. A method for treating arthritic conditions in a warm-blooded animal, which comprises administering to said animal an effective anti-arthritic amount of a compound as claimed in claim 1.

4,434,165

FUNGICIDAL COMPOSITIONS

Klaus Bohnen, Dielsdorf, Switzerland, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Sep. 22, 1981, Ser. No. 304,484

Claims priority, application Switzerland, Sep. 30, 1980, 7311/80; Jul. 14, 1981, 4611/81

Int. Cl.³ A01N *43/84*

U.S. Cl. 424—248.4 **3 Claims**

1. A fungicidal composition comprising an amount, which is effective as a fungicide, of a combination of compound I cis-4-[3-(p-tert.butyl-phenyl)-2-methylpropyl]-2,6-dimethyl mor-

pholine and compound II 1-tert.butyl-2-(1,2,4-triazol-1-yl)-2-(o,p-dichlorobenzyl)-ethanol, wherein compounds I and II are present in the weight ratio of 2-10:1.

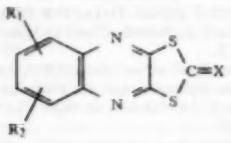
4,434,166

ANIMAL COCCIDIOSIS PREVENTIVE

Ichiro Tanaka, Kodaira; Hiroshi Arato, Kagoshima, and Takaaki Wakabayashi, Kamakura, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

Filed Jan. 21, 1983, Ser. No. 459,914
Claims priority, application Japan, Jan. 28, 1982, 57-11020; Nov. 16, 1982, 57-199687
Int. Cl.³ A61K *31/495*
U.S. Cl. 424—250 17 Claims

1. A method for treating an animal suffering from animal coccidiosis which comprises administering to said animal a therapeutically effective amount of a composition comprising a quinoxaline compound of the formula:



wherein R_1 and R_2 are the same or different and represent hydrogen, lower alkyl, halogen or lower alkoxy, and X represents oxygen or sulfur.

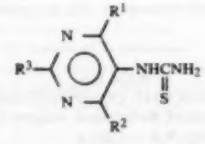
4,434,167

PYRIMIDYL THIOUREAS USEFUL FOR THE TREATMENT OF HYPERTENSION AND HYPERLIPIDEMIA

Wolfgang Stenzel, Reinbek, Fed. Rep. of Germany, assignor to Beiersdorf Aktiengesellschaft, Fed. Rep. of Germany

Division of Ser. No. 92,134, Nov. 7, 1979. This application Apr. 24, 1981, Ser. No. 257,444
Int. Cl.³ A61K *31/505*
U.S. Cl. 424—251 11 Claims

1. A composition for the treatment of hypertension and/or hyperlipidemia comprising an amount of a compound of the formula



wherein R^1, R^2, and R^3 are individually hydrogen, halogen, linear or branched alkoxy, or linear or branched alkyl, said alkoxy and said alkyl having 1 to 8 carbon atoms each, or pharmaceutically acceptable salts thereof; which is sufficient, when administered to a warm blooded animal, to provide a hypotensive and/or hypolipid effect in said animal, and a pharmaceutically acceptable carrier.

4,434,168

NARCOTIC ANTAGONISTS IN THE THERAPY OF SHOCK

John W. Holaday, Rockville, Md., and Alan I. Faden, Washington, D.C., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation-in-part of Ser. No. 3,699, Jan. 16, 1979, Pat. No. 4,267,182. This application Mar. 27, 1981, Ser. No. 248,622
Int. Cl.³ A01N *43/42*
U.S. Cl. 424—260 18 Claims

1. A method of treating an animal which is suffering from a form of shock selected from the group consisting of neurogenic, spinal and traumatic which comprises administering to said animal a therapeutically effective amount of a narcotic antagonist drug selected from the group consisting of naloxone, naltrexone, naiorphine, diprenorphine, levallorphan, pentazocine, metazocine, cyclazocine, etazocine, and the pharmaceutically-acceptable acid addition salts thereof.

4,434,169

PHARMACEUTICAL COMPOSITIONS AND METHODS

Bruno P. H. Poschel, and Donald E. Butler, both of Ann Arbor, Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Jan. 3, 1983, Ser. No. 455,396
Int. Cl.³ A61K *31/44*
U.S. Cl. 424—263 5 Claims

1. A method for treating memory loss in mammals suffering therefrom which comprises orally administering to said mammals 0.0002 mg to 0.03 mg/kg mammalian body weight of 3-phenoxypyridine or a pharmaceutically acceptable acid addition salt thereof.

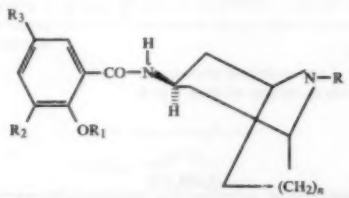
4,434,170

NOR-TROPANE DERIVATIVES, AND THEIR APPLICATION IN THERAPEUTICS

Philippe Dostert, Paris; Thierry Imbert, Noisy, and Bernard Bucher, Marnes la Coquette, all of France, assignors to Delalande S.A., Courbevoie, France

Filed Nov. 4, 1981, Ser. No. 318,244
Claims priority, application France, Nov. 7, 1980, 80 23785
Int. Cl.³ A61K *31/46*; C07D *451/04*
U.S. Cl. 424—265 16 Claims

1. A compound having the formula



wherein n is 1; R is 3-furylmethyl, benzyl or benzyl in which the ring is substituted with one or two halogens, methyl or cyano; R_1 is methyl or ethyl; R_2 is methoxy or ethoxy; R_3 is hydrogen, bromine, methoxy, nitro, acetyl, methylmercapto or ethylmercapto, with the proviso that when the set (R_3, n, R) is (H, 1, benzyl) the set (R_1, R_2) is not (CH_3, OCH_3), and pharmacologically acceptable acid addition salts thereof.

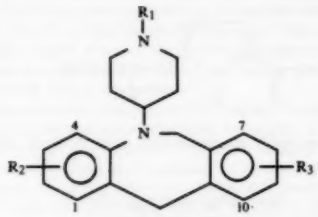
16. An anti-emetic or anti-constipation pharmaceutical composition for treating the digestive system comprising a therapeutically effective amount of a compound as claimed in claim 1, in combination with a pharmaceutically acceptable carrier.

4,434,171
DIBENZAZEPINE DERIVATIVES, PHARMACEUTICAL COMPOSITIONS CONTAINING THEM, AND PHARMACEUTICAL METHODS USING THEM

Werner Müller, Gümligen, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Filed Nov. 23, 1981, Ser. No. 323,759
Claims priority, application Switzerland, Nov. 28, 1980, 8829/80
Int. Cl.³ A61K *31/445;* C07D *401/04*
U.S. Cl. 424—267 8 Claims

1. A compound of formula I



I

wherein

R_1 is hydrogen, C_{1-4}-alkyl, C_{2-5}-alkyl substituted by cyano, C_{7-9}-phenylalkyl, C_{3-6}-cycloalkyl or C_{4-7}-cycloalkylalkyl, C_{2-5}-hydroxyalkyl or a physiologically acceptable hydrolyzable ester thereof, and

R_2 and R_3 are, independently of each other, hydrogen, halogen, trifluoromethyl, C_{1-4}-alkyl, C_{1-4}-alkoxy or C_{1-4}-alkylthio,

in free base form or in a pharmaceutically acceptable acid addition salt form.

7. A method of inducing or promoting or prolonging sleep or treating psychotic disturbances or depressions, which comprises administering a therapeutically effective amount of a compound of claim 1 in free base form or in a pharmaceutically acceptable acid addition salt form to a subject in need of such treatment.

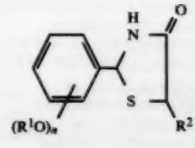
8. A pharmaceutical composition useful in inducing, promoting or prolonging sleep or in treating psychotic disturbances or depressions comprising a pharmaceutically acceptable carrier or diluent and a therapeutically effective amount of a compound of claim 1 in free base form or in a pharmaceutically acceptable acid addition salt form.

4,434,172
2-SUBSTITUTED-PHENYL-5-ALKYLTHIAZOLIDINE-4-ONE

Takao Kawasaki, Sayama; Yoshiaki Osaka, Nagareyama; Katsumi Komatsu, Matsudo; Yukiharu Yamaguchi, Tokyo, and Saichi Ono, Tokyo, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 25, 1981, Ser. No. 305,834
Claims priority, application Japan, Oct. 9, 1980, 55-141239
Int. Cl.³ C07D *277/14;* A61K *31/425*
U.S. Cl. 424—270 4 Claims

1. A compound of 2-substituted-phenyl-5-alkylthiazolidine-4-one having the formula (I)



(I)

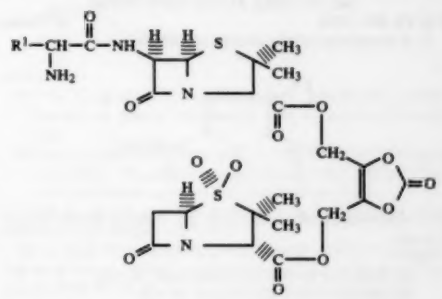
wherein R^1 and R^2 represent respectively a lower alkyl group of 1 to 3 carbon atoms and n denotes an integer of 1 to 3.

4,434,173
BIS-ESTERS OF 4,5-DI(HYDROXYMETHYL)-2-OXO-1,3-DIOXOLE AS ANTIBACTERIAL AGENTS

Willard M. Welch, Jr., Mystic, Conn., assignor to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 410,762, Aug. 23, 1982, abandoned. This application Nov. 15, 1982, Ser. No. 441,980
Int. Cl.³ A61K *31/43;* C07D *499/32, 317/40, 499/00*
U.S. Cl. 424—271 15 Claims

1. A compound of the formula



and the pharmaceutically-acceptable acid-addition salts thereof;

wherein R^1 is selected from the group consisting of phenyl and 4-hydroxyphenyl.

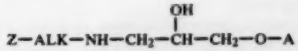
5. A pharmaceutical composition suitable for treating a bacterial infection in a mammalian subject which comprises an antibacterially-effective amount of a compound according to claim 1 and a pharmaceutically-acceptable carrier, in a weight ratio in the range from 1:4 to 4:1.

4,434,174
TREATING CARDIOVASCULAR DISEASES WITH N-(3-PHENOXY-2-HYDROXYPROPYL)BENZIMIDAZOLE-1-ALKANAMINES

Julius Diamond, Mountain Lakes, and Ronald A. Wohl, Morris Plains, both of N.J., assignors to Berlex Laboratories, Inc., Cedar Knolls, N.J.

Continuation-in-part of Ser. No. 261,331, May 7, 1981, Pat. No. 4,363,808, which is a continuation-in-part of Ser. No. 120,416, Feb. 11, 1980, abandoned. This application Mar. 2, 1982, Ser. No. 353,798
Int. Cl.³ A61K *31/415;* C07D *401/12, 235/06*
U.S. Cl. 424—273 B 19 Claims

1. A compound of the formula:



wherein Z is selected from the group consisting of 1-benzimidazolyl, methyl-1-benzimidazolyl; ALK is alkylene containing 2 to 6 carbon atoms; and A is selected from the group consisting of naphthyl, indenyl, tetrahydronaphthyl, 1-oxo-1,2,3,4-tetrahydro-5-naphthyl, 2,3-dihydroxy-1,2,3,4-tetrahydro-5-naphthyl, indolyl, 2-methylindolyl, 3,4-dihydro-2(1H)-quinolinon-5-yl, 5-methylcourmarin-8-yl, cyanopyridyl, carboxypyridyl, carbamoylpyridyl, alkoxycarbonylpyridyl, thiazolyl and 4-morpholino-1,2,5-thiadiazol-3-yl, or a pharmaceutically acceptable acid addition salt thereof.

14. The compound N-[3-(2-chlorophenoxy)-2-hydroxy-

propyl]-benzimidazole-1-ethanamine or a pharmaceutically acceptable acid addition salt thereof.

16. The method of treating a cardiovascular disease state in a mammalian host which comprises administering to said host a non-toxic effective amount of a compound of claims 1 or 14 to alleviate said disease state.

4,434,175
NONSTEROIDAL COMPOUNDS AS ANTI-INFLAMMATORY AND ANALGESIC AGENTS

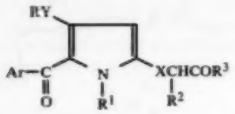
James B. Doherty, New Milford; Michael N. Chang, Westfield, and Conrad P. Dorn, Plainfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 291,688, Aug. 10, 1981, abandoned. This application May 3, 1982, Ser. No. 373,692

Int. Cl.[3] A61K *31/405*; C07D *207/36*

U.S. Cl. 424—274 12 Claims

1. A compound of the structural formula:



or a pharmaceutically acceptable salt, ester or amide thereof wherein

Ar is
- (a) phenyl or loweralkyl-substituted phenyl;
- (b) halo-loweralkyl-substituted phenyl;
- (c) hydroxy- or loweralkoxy-substituted phenyl;
- (d) halo-substituted phenyl;
- (e) loweralkylthio-substituted phenyl;
- (f) loweralkylsulfinyl-substituted phenyl; or
- (g) loweralkylsulfonyl-substituted phenyl;

R is
- (a) hydrogen;
- (b) loweralkyl;
- (c) lowercycloalkyl;
- (d) lower(cycloalkyl-alkyl);
- (e) loweralkenyl;
- (f) halo-loweralkyl; or
- (g) phenyl- or substituted phenyl-loweralkyl; groups (a)-(g) above being unsustituted or substituted by lower alkyl, lower alkoxy, halo, cyano, carboxy, sulfoamino, carbamoyl, sulfonyl, sulfinyl, azido, amino, substituted amino, halololoweralkyl, carboxyloweralkyl, carbamoyl-loweralkyl, N-substituted carbamoylloweralkyl or a combination thereof;

R^1 is hydrogen or loweralkyl;

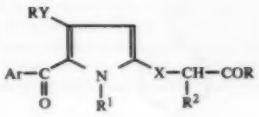
R^2 is hydrogen, loweralkyl or halo; and

R^3 is
- (a) hydroxy;
- (b) loweralkoxy;
- (c) amino;
- (d) loweralkylamino;
- (e) di(loweralkyl)amino;
- (f) morpholinyl;
- (g) bis(hydroxyloweralkyl)amino;
- (h) loweralkylylcyclohexylamino;
- (i) glucosamino;
- (j) lower(alkanoyloxyalkoxy);
- (k) aroyloxyloweralkoxy;
- (l) lower(alkoxycarbonyloxyalkoxy);
- (m) aryloxycarbonyloxyloweralkoxy;
- (n) tri(loweralkylamino)loweralkoxy;
- (o) lower(alkanoylaminoalkoxy);
- (p) hydroxyloweralkoxy;
- (q) loweralkoxyalkoxy;
- (r) di(loweralkylamino)loweralkoxy;
- (s) N-pyrrolidinylloweralkoxy;
- (t) N-piperidinylloweralkoxy;
- (u) N-morpholinylloweralkoxy; or
- (v) 4-methyl-1-piperazinylloweralkoxy.

X is $-(CH_2)_{0\text{-}10}-$, $-COCH_2-$ or $-CH_2CO-$; and

Y is oxygen, sulfur, sulfinyl, or sulfonyl.

9. A method of treatment of inflammatory conditions, fever and pain which comprises the administration to a mammalian species in need of such treatment an effective amount of a compound of structural formula (I)



or a pharmaceutically acceptable salt, ester or amide thereof wherein

Ar is
- (a) phenyl or loweralkyl-substituted phenyl;
- (b) halo-loweralkyl-substituted phenyl;
- (c) hydroxy- or loweralkoxy-substituted phenyl;
- (d) halo-substituted phenyl;
- (e) loweralkylthio-substituted phenyl;
- (f) loweralkylsulfinyl-substituted phenyl;
- (g) loweralkylsulfonyl-substituted phenyl;

R is
- (a) hydrogen;
- (b) loweralkyl;
- (c) lowercycloalkyl;
- (d) lower(cycloalkyl-alkyl);
- (e) loweralkenyl;
- (f) halo-loweralkyl; or
- (g) phenyl- or substituted phenyl-loweralkyl; groups (a)-(g) above being unsubstituted or substituted by lower alkyl, lower alkoxy, halo, cyano, carboxy, sulfoamino, carbamoyl, sulfonyl, sulfinyl, azido, amino, substituted amino, halololoweralkyl, carboxyloweralkyl, carbamoyl-loweralkyl, N-substituted carbamoylloweralkyl or a combination thereof;

R^1 is hydrogen or loweralkyl;

R^2 is hydrogen, loweralkyl or halo; and

R^3 is
- (a) hydroxy;
- (b) loweralkoxy;
- (c) amino;
- (d) loweralkylamino;
- (e) di(loweralkyl)amino;
- (f) morpholinyl;
- (g) bis(hydroxyloweralkyl)amino;
- (h) loweralkylcyclohexylamino;
- (i) glucosamino;
- (j) lower(alkanoyloxyalkoxy);
- (k) aroyloxyloweralkoxy;
- (l) lower(alkoxycarbonyloxyalkoxy);
- (m) aryloxycarbonyloxyloweralkoxy;
- (n) tri(loweralkylamino)loweralkoxy; or
- (o) lower(alkanoylaminoalkoxy);
- (p) hydroxyloweralkoxy;
- (q) loweralkoxyalkoxy;
- (r) di(loweralkylamino)loweralkoxy;
- (s) N-pyrrolidinylloweralkoxy;
- (t) N-piperidinylloweralkoxy;
- (u) N-morpholinylloweralkoxy; or
- (v) 4-methyl-1-piperazinylloweralkoxy.

X is $-(CH_2)_{0\text{-}10}-$, $-COCH_2-$ or $-CH_2CO-$; and

Y is oxygen, sulfur, sulfinyl, or sulfonyl.

4,434,176
USE OF 4-(2-BENZOYLOXY-3-TERT-BUTYLAMINOPROPOXY)-2-METHYL-INDOLE FOR INDUCING BETA-ADRENOCEPTOR BLOCADE

Franz Troxler, Bottmingen, and Fritz Seemann, Ettingen, both of Switzerland, assignors to Sandoz Ltd., Basle, Switzerland

Division of Ser. No. 138,901, Apr. 10, 1980, Pat. No. 4,340,541. This application May 6, 1982, Ser. No. 375,369

Claims priority, application Switzerland, Aug. 15, 1975, 10714/75

Int. Cl.³ A61K *31/40*

U.S. Cl. 424—274 **5 Claims**

1. A pharmaceutical composition comprising 4-(2-benzoyloxy-3-tert.butylaminopropoxy)-2-methyl-indole or a pharmaceutically acceptable acid addition salt thereof, useful as a β-adrenoceptor blocker, for treating Angina pectoris, tachycardia or arrhythmia, in association with a pharmaceutically acceptable diluent or carrier.

2. A method of inducing β-adrenoceptor blockage in animals which comprises administering to an animal in need of such treatment a therapeutically effective amount of 4-(2-benzoyloxy-3-tert.butylaminopropoxy)-2-methyl-indole or a pharmaceutically acceptable acid addition salt thereof.

3. A method of treating Angina pectoris in animals which comprises administering to an animal in need of such treatment a therapeutically effective amount of 4-(2-benzoyloxy-3-tert-.butylaminopropoxy)-2-methyl-indole or a pharmaceutically acceptable acid addition salt thereof.

4. A method of treating arrhythmia in animals which comprises administering to an animal in need of such treatment a therapeutically effective amount of 4-(2-benzoyloxy-3-tert-.butylaminopropoxy)-2-methyl-indole or a pharmaceutically acceptable acid addition salt thereof.

5. A method for treating tachycardia in animals which comprises administering to an animal in need of such treatment a therapeutically effective amount of 4-(2-benzoyloxy-3-tert-.butylaminopropoxy)-2-methyl-indole or a pharmaceutically acceptable acid addition salt thereof.

4,434,177
α-METHYLDOPA-L-ASCORBIC ACID COMPOSITIONS

Stanley Vickers, Perkasie, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 139,913, Apr. 14, 1980, Pat. No. 4,321,264. This application Oct. 28, 1981, Ser. No. 315,696

Int. Cl.³ A61K *31/375*

U.S. Cl. 424—280 **7 Claims**

1. A pharmaceutical composition for treating hypertension wherein the antihypertensively effective component consists essentially of (A) L-α-methyl-3,4-dihydroxyphenylalanine and (B) L-ascorbic acid wherein the weight ratio of (A):(B) is at least about 3:1.

6. A method of treating hypertension in humans by administering a anti-hypertensive effective amount of a claim 1 composition.

4,434,178
ANTIPERSPIRANTS

Hans U. Hostettler, Arlesheim, and Horst Pauling, Bottmingen, both of Switzerland, assignors to Hoffmann-La Roche, Inc., Nutley, N.J.

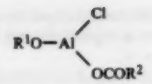
Filed Sep. 29, 1981, Ser. No. 306,696

Claims priority, application Switzerland, Oct. 3, 1980, 7403/80

Int. Cl.³ A01N *55/02*; A61K *31/28*

U.S. Cl. 424—287 **14 Claims**

1. A compound of the formula



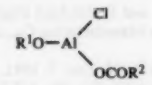
I

wherein

R^1 is C_{1-18}-alkyl, C_{2-18}-alkoxyalkyl, phenoxy-C_{1-6}-alkyl, phenyl or phenyl substituted with C_{2-6}-alkoxycarbonyl and

R^2 is C_{1-15}-alkyl; phenyl or phenyl substituted with halogen, C_{1-4}-alkyl, C_{1-4}-alkoxy, C_{2-6}-alkanoyloxy and/or C_{2-6}-alkoxycarbonyl; phenyl-C_{1-4}-alkyl; or pyridyl.

9. An antiperspant composition comprising an effective amount of at least one compound of the formula



I

wherein

R^1 is C_{1-18}-alkyl, C_{2-18}-alkoxyalkyl, phenoxy-C_{1-6}-alkyl, phenyl or phenyl substituted with C_{2-6}-alkoxycarbonyl and

R^2 is C_{1-15}-alkyl; phenyl or phenyl substituted with halogen, C_{1-4}-alkyl, C_{1-4}-alkoxy, C_{2-6}-alkanoyloxy and/or C_{2-6}-alkoxycarbonyl; phenyl-C_{1-4}-alkyl; or pyridyl,

as well as carrier material customary in cosmetics or other cosmetically-effective adjuvant.

14. A method for inhibiting transpiration, comprising applying an effective amount of antiperspirant composition according to claim 9, 10, 11, 12 or 13 to the area to be treated.

4,434,179
WOUND-HEALING PROMOTERS

Shinsaku Kobayashi, and Akira Ogiso, both of Hiromachi, Japan, assignors to Sankyo Company, Limited, Tokyo, Japan

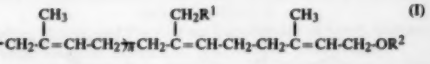
Filed Mar. 2, 1982, Ser. No. 353,887

Claims priority, application Japan, Mar. 17, 1981, 56-38327

Int. Cl.³ A61K *31/235, 31/075, 31/045*

U.S. Cl. 424—308 **37 Claims**

1. A method for the external treatment of wounds in humans and other animals, which method comprises applying topically to the site of the wound a compound having the formula (I):



(I)

wherein:

R^1 represents a hydroxy group, a C_1–C_8 alkoxy group, a straight or branched C_2–C_{18} aliphatic acyloxy group, a benzoyloxy group or a cinnamoyloxy group;

R^2 represents a hydrogen atom, a C_1–C_8 alkyl group, a C_2–C_8 aliphatic acyl group, a benzoyl group or a cinnamoyl group; and

n represents an integer from 1 to 3

in an amount effective to promote healing of the wound.

4,434,180
INSECT CONTROL METHODS WITH ABSCISIC ACID

Saralee N. Visscher, 516 S. 6th Ave., Bozeman, Mont. 59715

Continuation of Ser. No. 133,631, Mar. 27, 1980, filed as PCT US79/00546, Jul. 27, 1979, published as WO80/00295, Mar. 6, 1980, §102(e) date Mar. 27, 1980, abandoned, which is a continuation-in-part of Ser. No. 929,116, Jul. 28, 1978, Pat. No. 4,209,530.

This application Apr. 2, 1982, Ser. No. 364,647

Int. Cl.³ A01N *37/00*

U.S. Cl. 424—317 **2 Claims**

1. A method for the control of houseflies characterized by the steps of applying a reproduction-inhibiting amount of abscisic acid in a concentration of about 6 mg per liter of an

aqueous carrier, to food on which said houseflies feed, thereby reducing the ability of the houseflies to reproduce and thus control proliferation of the houseflies.

2. A method for the control of fruit flies, characterized by the step of applying a reproduction-inhibiting amount of abscisic acid contained in an aqueous carrier in a concentration ranging from at least about 6 mg per liter to about 600 mg per liter directly to eggs of the fruit fly, thereby reducing the ability of the fruit fly to reproduce and thus control proliferation of the fruit flies.

4,434,181

TEAT DIP

George B. Marks, Sr., Hudson, Wis., and D. Michael Fearing, St. Paul, Minn., assignors to Fearing Manufacturing Co., Inc., St. Paul, Minn.

Continuation-in-part of Ser. No. 327,795, Dec. 7, 1981, abandoned. This application Sep. 29, 1982, Ser. No. 427,741

Int. Cl.³ A61K *31/155, 47/00*

U.S. Cl. 424—326 **8 Claims**

1. A liquid teat dip composition having a freezing point not less than about −5° C. and capable, upon application to the teats of an animal, of quickly forming a soft, flexible coating that is substantially dry to the touch and that can readily be washed from the teats by water washing, comprising an effective quantity of a chlorhexidine antiseptic, a water-soluble film-former derived from cellulose in an amount ranging from about 10% to about 20% by weight of the composition, and a liquid vehicle including a volatile alcohol in an amount not less than about 80% by weight of the composition.

4,434,182

INSECTICIDAL SUBSTITUTED-BIPHENYLMETHYL OXIME ETHERS

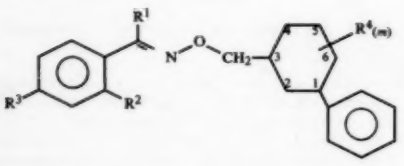
Philip A. Cruickshank, Princeton, and Thomas G. Cullen, Plainsboro, both of N.J., assignors to FMC Corporation, Philadelphia, Pa.

Filed Nov. 1, 1982, Ser. No. 438,108

Int. Cl.³ A01N *33/24;* **C07C** *131/00*

U.S. Cl. 424—327 **9 Claims**

1. The E isomer of a compound of the formula



wherein R^1 is isopropyl, cyclopropyl, cyclopropylmethyl, or cyclobutyl; R^2 is hydrogen, halogen, or alkyl of 1 to 4 carbon atoms; R^3 is hydrogen, halogen, straight or branched chain alkyl of 1 to 4 carbon atoms, haloalkyl of 1 or 2 carbon atoms, or the group $-OCFZ^1Z^2$ wherein Z^1 and Z^2 are independently hydrogen or fluorine; and R^4 is alkyl of 1 to 4 carbon atoms and m is 1 or 2, or R^4 is halogen and m is 2–4; with the proviso that when R^1 is isopropyl, then m is 1 and R^4 is alkyl and is positioned at the C-2 carbon atom.

7. An insecticidal/acaricidal composition comprising an insecticidally/acaricidally effective amount of the compound of any one of claims 1 to 6 in admixture with a compatible extender or carrier.

9. A method for controlling insects/acarids which comprises applying to the insect/acarid or to a locus where control is desired an insecticidally/acaricidally effective amount of the composition of claim 7.

4,434,183

USE OF HALOPROGIN TO TREAT *HERPES LABIALIS*

Isaac R. McGraw, Newtown, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Sep. 27, 1982, Ser. No. 424,120

Int. Cl.³ A61K *31/085, 31/79*

U.S. Cl. 424—340 **2 Claims**

1. A method of treating herpes I infections of the labial area in mammals comprising topically administering to the mammal in need of said treatment an effective amount for treating the herpes I virus of a composition of 3-iodo-2-propynyl 2,4,5-trichlorophenyl ether and at least one pharmaceutically acceptable carrier, wherein the compound is from about 0.01 to about 95% by weight of the composition.

4,434,184

YOGURT SPREAD RESEMBLING CREAM CHEESE

N. Michael Kharrazi, 55 S. La Cumbre Rd., Santa Barbara, Calif. 93105

Filed Dec. 13, 1982, Ser. No. 449,431

Int. Cl.³ A23C *9/12, 19/076, 20/00*

U.S. Cl. 426—40 **6 Claims**

1. The method of making a yogurt spread having the consistency of cream cheese and about 3–10% of the fat content of conventional cream cheese comprising the steps of:

utilizing a quantity of liquid milk;

heating the milk to a temperature of approximately one hundred and eighty degrees Fahrenheit;

cooling the milk to approximately one hundred and seven degrees Fahrenheit;

evenly mixing a quantity of yogurt starter culture to the cooled milk and providing sufficient time for the resulting mixture to form yogurt;

evenly mixing with the yogurt a brine solution containing about 3% to about 12% of salt in an amount of about one-fourth to about equal by volume of the yogurt; and

centrifuging the resulting mixture of yogurt and brine to remove the bulk of whey therefrom to obtain said cream cheese consistency.

4,434,185

METHOD FOR PREVENTING DECAY OF FRUIT

Paul M. Nelson, Riverside, Calif., assignor to FMC Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 166,944, Jul. 8, 1980, abandoned, and Ser. No. 166,945, Jul. 8, 1980, abandoned. This application Sep. 8, 1981, Ser. No. 300,080

Int. Cl.³ A23B *7/00, 7/10, 7/16*

U.S. Cl. 426—308 **3 Claims**

1. A method of protecting citrus against strains of penicillium digitatum and penicillium italicum which have become resistant to the antifungal agents sec.-butylamine, sodium o-phenylphenol, 2-substituted benzimidazoles and sorbates, without chemically burning the fruit, comprising subjecting the fruit to the following sequential treatment:

(1) applying to the fruit a coating of a sorbate selected from the class consisting of sorbic acid and potassium sorbate wherein said sorbate is about 2% aqueous solution of potassium sorbate or an equivalent amount of sorbic acid; and

(2) applying to the sorbate coated fruit a wax containing as active components an additional 2% amount of the sorbate aforesaid and an antifungal agent selected from the class consisting of 1-butyl-carbamoyl-2-benzimidazole carbamate(benomyl) and 2-(4-thiazolyl)benzimidazole (TBZ).

4,434,186

STABLE AERATED FROZEN FOOD PRODUCT

Nitin Desia, St. Paul; Rory A. M. Delaney, Minnetonka; Peter Brouwer, Plymouth, and Victor T. Huang, Brooklyn Center, all of Minn., assignors to The Pillsbury Company, Minneapolis, Minn.

Continuation-in-part of Ser. No. 369,394, Apr. 19, 1982, abandoned. This application Jan. 4, 1983, Ser. No. 455,617

Int. Cl.³ A23G 9/02

U.S. Cl. 426—565 19 Claims

1. In a process for preparing an aerated frozen dessert product, wherein water, fat, protein, emulsifier and stabilizer are blended together to form a mix and said mix is homogenized to form an oil-in-water emulsion which is subsequently whipped under freezing conditions, the improvement which comprises:

selecting an edible oil which has an SFI of at least 25 at 70° F.;

homogenizing said mix to form an emulsion of fat globules having a particle size wherein the average d_{vs} value is 0.2 to 1.5 microns, and a particle size distribution wherein the ratio of d_{max} to d_{vs} has a quotient in the range from 9 to 14;

aging the homogenized mix to crystallize said fat globules prior to said whipping and freezing; and

substantially retaining said particle size and particle size distribution after said whipping and freezing.

4,434,187

MEAT CURING COMPOSITION

William S. Chandler, St. Clair; Walter F. Wilkens, Marysville, and John F. Heiss, St. Clair, all of Mich., assignors to Diamond Crystal Salt Company, St. Clair, Mich.

Filed Mar. 16, 1982, Ser. No. 358,629

Int. Cl.³ A23B 4/02, 4/14

U.S. Cl. 426—652 14 Claims

1. A substantially uniform free-flowing particulated composition suitable for use in the curing of meat products consisting essentially of controlled amounts of at least one water soluble finely particulated curing constituent, finely particulated water insoluble amorphous, tocopherol absorbent porous silica particles and dl-alpha-tocopherol distributed substantially uniformly on the particles of said curing constituent and distributed on and absorbed in said silica particles.

4,434,188

METHOD FOR SYNTHESIZING DIAMOND

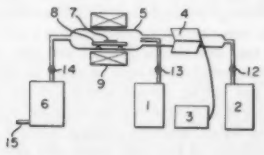
Mutsukazu Kamo, Tsuchiura; Seiichiro Matsumoto; Yoichiro Sato, both of Sakura, and Nobuo Setaka, Nagareyama, all of Japan, assignors to National Institute for Researches in Inorganic Materials, Ibaraki, Japan

Filed Nov. 17, 1982, Ser. No. 442,506

Claims priority, application Japan, Dec. 17, 1981, 56-204321; Jun. 24, 1982, 57-109044

Int. Cl.³ B05D 3/14

U.S. Cl. 427—39 5 Claims



1. A method for synthesizing diamond, characterized in that hydrogen gas which has passed through a micro-wave non-electrode discharge and mixed with hydrocarbon gas, or a mixture gas consisting of hydrocarbon and hydrogen after its passing through a micro-wave non-electrode discharge, is introduced onto the surface of a substrate heated to a temperature of from 300° to 1300° C. to decompose hydrocarbon in its energetically activated state for the diamond deposition.

4,434,189

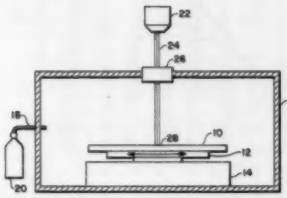
METHOD AND APPARATUS FOR COATING SUBSTRATES USING A LASER

Isidor Zaplatynsky, Fairview Park, Ohio, assignor to The United States of America as represented by the Adminstrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Mar. 15, 1982, Ser. No. 358,398

Int. Cl.³ B05D 3/06; C23C 13/08; B05B 5/00

U.S. Cl. 427—53.1 10 Claims



1. A method of forming a protective coating on a substrate of a metal selected from the group consisting of titanium and titanium alloys comprising the steps of

positioning said substrate in purified nitrogen gas,

focusing a beam of infrared radiation onto a surface of said substrate to rapidly heat a small area on the substrate to a temperature below the melting point of the substrate whereby said nitrogen reacts with the heated titanium in said small area to form initially a solid solution which subsequently forms titanium nitride without melting, and

moving said small area along the surface of said substrate to coat the same.

4,434,190

PROCESS FOR PREVENTING FORMATION OF BLACK ICE ON ROADS BY APPLYING A MIXTURE OF SALT AND AQUEOUS FIXATION COMPOSITION ONTO THE ROAD SURFACE

Robert Dubois, and Pierre-Yves Dubois, both of Lutry, Switzerland, assignors to Selfixat, S.A., Geneva, Switzerland

Continuation of Ser. No. 194,952, Oct. 8, 1980, abandoned. This application Aug. 3, 1982, Ser. No. 404,861

Claims priority, application France, Oct. 11, 1979, 79 25299

Int. Cl.³ B05C 1/16; B05D 5/10

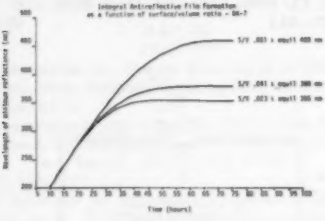
U.S. Cl. 427—136 5 Claims

1. Process for preventing the formation of black ice on roads, comprising applying onto the road surface at least one layer of a mixture of at least one salt which lowers the freezing point of water and a fixation composition which comprises an aqueous dispersion of a film-forming polymer or copolymer and at least one water-soluble hydrophobic agent which, in air, becomes insoluble in water, the proportion by weight of hydrophobic agent with respect to the dry extract of the film-forming polymer or copolymer being from 5 to 25%, and the proportion of the fixation composition with respect to the salt being such that the total dry weight of film-forming polymer or copolymer and hydrophobic agent corresponds to from 10 to 120% of the weight of the salt, the process including the steps of applying onto the road surface a first layer of a mixture with a high content of fixation composition and a low content of salt, allowing the water to evaporate, then applying a second layer of a mixture having a high content of salt and a low content of fixation composition, allowing the water to evaporate and finally applying a third layer of a mixture with a high content of fixation composition and a low content of salt.

4,434,191
INTEGRAL ANTI-REFLECTIVE SURFACES OF SILICATE GLASSES

Lee M. Cook, Kingston; Karl-Heinz Mader, Clarks Summit, both of Pa., and Roland Schnabel, Hofheim, Fed. Rep. of Germany, assignors to Schott Glass Technologies, Inc., Duryea, Pa.

Filed Oct. 6, 1981, Ser. No. 309,149
Int. Cl.³ B05D 5/06
U.S. Cl. 427—165 **19 Claims**



1. In a method of preparing an antireflective surface on a silicate glass surface of a particular silicate glass composition containing at least 5 weight % of alkali metal, comprising treating the silicate surface with an aqueous solution of pH 7.0–8.5 which contains an electrolyte with a dissociation constant at 20° C. greater than 10^{-6} and which contains a polyvalent cation, the improvement comprising

conducting the treatment step with a ratio of the area of said silicate glass surface to the volume of said aqueous treating solution such that the resultant antireflective surface is substantially uniform and has a predetermined wavelength range of minimum reflectance, and, in order to achieve said predetermined wavelength range, adjusting the duration of the treatment step in accordance with a premeasured dependence, for said particular silicate glass composition, of wavelength of minimum reflectance as a function of said ratio and duration of treatment.

4,434,192
PROCESS FOR MAKING WATER ACTIVATABLE TILES

Solomon Neumann, London, England, assignor to Easy-Do Products Limited, London, England

Continuation of Ser. No. 939,694, Sep. 5, 1978, abandoned. This application Mar. 7, 1980, Ser. No. 128,182
Claims priority, application United Kingdom, Sep. 13, 1977, 38195/77
Int. Cl.³ B05D 1/32
U.S. Cl. 427—282 **6 Claims**

1. A process for the manufacture of a water-activatable self-adhering rigid tile product which consists of

dispersing in a liquid medium which includes an organic solvent and water a mixture consisting of a hydraulic material, a filler and a water-soluble adhesive to form a dispersion,

applying said dispersion to at least a portion of the face of a rigid tile intended to be adhered to a supporting surface, and

drying said dispersion on said tile face to evaporate said liquid medium, thereby leaving a water-activatable self-adhering paste which is activatable by immersion in water for less than about 60 seconds.

4,434,193
METHOD FOR RETARDING MASONRY EFFLORESCENCE

Thomas Beckenhauer, 14439 N. 107th, Longmont, Colo. 80501

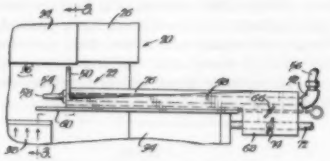
Filed Sep. 22, 1981, Ser. No. 304,699
Int. Cl.³ A23B 5/00; A23J 1/08
U.S. Cl. 427—299 **9 Claims**

1. The method of retarding the efflorescence of masonry structures comprising cleaning and washing the masonry to remove existing efflorescence deposits, allowing the masonry structure to dry to at most a damp condition, and thereafter applying to the masonry a coating of an acidic glycol solution at the rate of about one gallon per one hundred square feet to penetrate the masonry and thereby retard efflorescence thereof.

4,434,194
EDGE DAM FOR PAPER COATING APPARATUS AND METHOD

Kenneth W. Gebert, Wisconsin Rapids, and Pat A. Rajski, Stevens Point, both of Wis., assignors to Consolidated Papers, Inc., Wisconsin Rapids, Wis.

Filed Feb. 22, 1982, Ser. No. 350,758
Int. Cl.³ B05C 5/02
U.S. Cl. 427—356 **15 Claims**



1. An improved edge dam assembly for an applicator for applying coating liquid to a moving web of paper carried through an application zone, wherein the applicator is of the type having a body defining a chamber therein with an elongate opening to the chamber positionable generally adjacent to and transversely across the web, the chamber receiving coating liquid and directing the same through the opening and into the application zone for being applied onto the web, said edge dam assembly comprising seal means mountable at a side end of the opening and zone inwardly of the side edge of the web and having a passage therethrough in communication with the side end of the zone; means for introducing a gas under pressure through said seal means passage and into the zone to generate at the side end of the zone adjacent to said seal means a pressurized gas barrier pocket which extends inwardly of said seal means and web edge into the zone and is substantially void of coating liquid, whereby coating liquid in the zone is maintained inwardly of said seal means and prevented from leaking therepast; and a plate adjustable to move an end thereof into the side end of the zone a limited distance inwardly of said seal means and between said seal means and the chamber opening thereat to block coating liquid introduced into the zone through the chamber opening thereat from being directed toward said gas barrier pocket to control the inward extent of said gas barrier pocket into the side end of the zone and the extent of an uncoated margin on the web edge.

4,434,195

BONDING SILICONE RUBBER

Olgerts Skostins, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Continuation-in-part of Ser. No. 172,874, Jul. 28, 1980, abandoned. This application Feb. 9, 1982, Ser. No. 347,207
Claims priority, application Canada, Jun. 26, 1981, 380714
Int. Cl.³ B05D 3/02
U.S. Cl. 427—387 9 Claims

6. A method of bonding silicone rubber to a substrate comprising

(1) mixing silicone rubber stock of the type comprising 100 parts by weight of silicone rubber base, from 0 to 150 parts by weight of siliceous extending filler with an average particle size of less than 25 micrometres and a surface area of less than 50 m^2/g, and from 0.1 to 5 parts by weight of organic peroxide suitable for vulcanizing the silicone rubber base, with sufficient adhesion additive composition consisting essentially of

(a) 100 parts by weight of polydiorganosiloxane gum, wherein the organic radicals are selected from the group consisting of methyl, vinyl, phenyl, 3,3,3-trifluoropropyl radicals and mixtures thereof,

(b) from 70 to 220 parts by weight of ethylpolysilicate,

(c) from 10 to 40 parts by weight of acryloxyalkylsilane of the formula

$$CH_2{=}C(R)C(=O)O{-}R'{-}Si(CH_3)_aX_{(3-a)}$$

in which R is selected from the group consisting of hydrogen and methyl radical, R' is an alkylene radical of from 1 to 4 inclusive carbon atoms, X is a radical selected from the group consisting of lower alkoxy radicals of from 1 to 3 inclusive carbon atoms and acetoxy radical, a is from 0 to 2 inclusive, to provide an amount such that (b)+(c) is less than 4 percent by weight of silicone rubber composition, to yield a heat vulcanizable silicone rubber composition,

(2) forming a combination wherein the silicone rubber composition of (1) contacts a surface of the substrate, and thereafter

(3) heating the combination to a temperature high enough to vulcanize the silicone rubber composition, producing a vulcanized silicone rubber bonded to the substrate surface.

4,434,196

METHOD OF ACCELERATING THE DRYING OF WET HYDROPOHILIC SUBSTRATES

Tibor Robinson, Birsfelden, and Charles Voegtlin, Arisdorf, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Filed Mar. 17, 1982, Ser. No. 359,099
Claims priority, application Fed. Rep. of Germany, Mar. 23, 1981, 3111392
Int. Cl.³ B05D 3/02
U.S. Cl. 427—389 27 Claims

1. A process for accelerating the drying of a wet hydrophilic fibrous substrate selected from the group consisting of textiles, skins, pelts and leather, which comprises the steps of

(i) applying to the wet substrate by an exhaust process 0.05 to 1.0 g. per kg. dry weight of substrate of a mixture comprising

(A) a cationic agent having affinity for the fibers, and

(B) an emulsified paraffinic wax in an aqueous medium, said component (B) being in the form of an aqueous emulsion containing the paraffinic wax and an emulsifying agent suitable for emulsifying said wax, and,

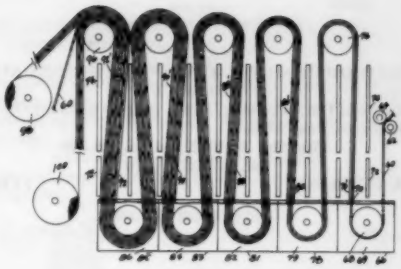
(ii) drying the thus-treated substrate.

4,434,197

NON-STICK ENERGY-MODIFYING COOKING LINER AND METHOD OF MAKING SAME

John V. Petriello, Huntington, N.Y., and Michael N. La Torra, North Palm Beach, Fla., assignors to N. F. Industries, Inc., Winston-Salem, N.C.

Filed Aug. 25, 1982, Ser. No. 411,350
Int. Cl.³ B05D 1/36
U.S. Cl. 427—407.1 3 Claims



1. The method of manufacturing a thin, flexible film for use as a cooking aid comprising the steps of:

(a) forming a first layer of pure polytetrafluoroethylene by depositing a liquid dispersion on a carrier, drying and sintering said liquid dispersion;

(b) forming a second layer on said first layer by depositing a liquid co-dispersion of polytetrafluoroethylene and a particulate energy-absorbing material, the percent solid content of said particulate energy-absorbing material being between 1% to 20%, drying and sintering said liquid co-dispersion; and

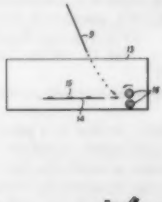
(c) subsequently, forming a third layer of pure polytetrafluoroethylene on the second layer by depositing a second liquid dispersion, drying and sintering said second liquid dispersion.

4,434,198

DUPLICATING STENCIL

Leslie Clark, New Castle upon Tyne, England, assignor to Roneo Alcatel Limited, Romford, England

Division of Ser. No. 120,513, Feb. 11, 1980, Pat. No. 4,351,685, which is a continuation of Ser. No. 929,467, Jul. 31, 1978, abandoned. This application Oct. 26, 1981, Ser. No. 314,725
Claims priority, application United Kingdom, Aug. 1, 1977, 32243/77
Int. Cl.³ B32B 31/00; D21F 11/00; B41L 11/06; B05D 5/06
U.S. Cl. 428—43 4 Claims



1. A stencil assembly for use in the formation of duplicating stencils by thermal bonding of an ink-impermeable layer of a master to an electrophotographic image attached to a substrate

and subsequent separation of the substrate and the master such that the image carries away parts of the ink-impermeable layer, said stencil assembly comprising

(a) a porous base layer,

(b) an ink-impermeable layer,

(c) a layer of adhesive detachably attaching said ink-impermeable layer to said base layer,

(d) said ink-impermeable layer comprising

(1) a synthetic resin composition rendered frangible by inclusion therein in suspension of finely divided zinc oxide dispersed throughout said synthetic resin composition.

4,434,199

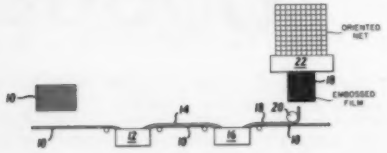
METHOD OF MANUFACTURING A THIN NET AND PRODUCT

Timothy K. Fair, Sr., Blaine, Minn., assignor to Conwed Corporation, St. Paul, Minn.

Filed Sep. 29, 1982, Ser. No. 428,040

Int. Cl.³ B32B *3/10*

U.S. Cl. 428—134 **7 Claims**



1. A process for making a net product comprising the steps of:

(a) coating a template having a net structure with a first reactant chosen from a first predetermined group of polycondensation reaction polymers, said net structure having integral joints;

(b) reacting said first reactant coated on said template with a second predetermined polycondensation reaction polymer for forming a polycondensation reaction of the second reaction polymer with said first reactant polymer;

(c) allowing said polymerized resin coating to set to form a film on said template; and

(d) stripping the said polymerized resin film from said template.

4,434,200

IMPREGNATED WOVEN FENCING PRODUCT

William G. Fash, Hackensack, N.J., and Delbert A. Davis, Kernersville, N.C., assignors to Burlington Industries, Inc., Greensboro, N.C.

Continuation-in-part of Ser. No. 773,156, Mar. 1, 1977, abandoned, which is a continuation of Ser. No. 355,733, Apr. 30, 1973, abandoned, which is a continuation-in-part of Ser. No. 134,237, Apr. 15, 1971, abandoned. This application Nov. 27, 1978, Ser. No. 963,890

Int. Cl.³ B32B *7/00*

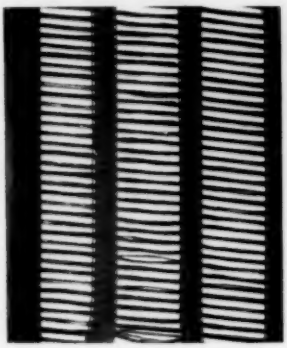
U.S. Cl. 428—257 **6 Claims**

1. An improved weather-resistant fencing product comprising:

a length of fabric woven in a predetermined width from strands of tough, elastic, synthetic plastic material,

said fabric having a relatively thin elastomeric, weather-resistant coating substantially evenly adhered to the surface of and impregnated into each of said strands thereby encapsulating and adhering said strands to each other to rigidify and support the woven product, and to render said product capable of withstanding sustained periods of direct sunlight, the relative thickness of said coating being no greater than the diameter of each of said strands,

said woven fabric having laterally spaced longitudinal bands extending in the warp direction only of relatively tightly woven warp and uniformly spaced filling strands separated by relatively open longitudinal bands containing only filling strands, said longitudinal bands having a pair of strands exteriorly along each side thereof, said filling strands being bound together in groups of at least two filling strands by said pair of longitudinal strands to form



a plurality of spaced apart filling strand groups extending along the length of said coated fabric, said open bands defining open spaces, the open spaces being free from said elastomeric coating thereby permitting passage of wind through said open spaces without damage to the coated, impregnated fabric while creating air currents.

4,434,201

POROUS PANEL

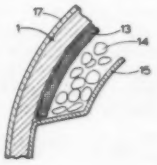
Bryan E. Humphreys, Carlisle, England, assignor to T.K.S. (Aircraft De-Icing) Limited, Haltwhistle, England

Continuation of Ser. No. 438,697, Nov. 2, 1982, abandoned. This application Jun. 20, 1983, Ser. No. 505,762

Claims priority, application United Kingdom, Nov. 13, 1981, 8134230

Int. Cl.³ B32B *3/10, 3/02, 7/12*; B64D *15/08*

U.S. Cl. 428—137 **22 Claims**



1. A porous panel for the distribution of fluid, comprising an outer sheet of porous material over the surface of which the fluid is to be distributed, a backing sheet of microporous material in contact with one side of the outer sheet, and a sheet of fluid impervious material which is spaced from the microporous sheet so that fluid can be introduced into the space between the microporous sheet and the impervious sheet whence it can pass through the porous sheets to the outer surface of the outer sheet, the sheets being secured to one another by adhesive bonding over a region located outwardly of the said space.

4,434,202

SLIDE MEMBER

Satoru Uedaira; Hidetoshi Shimizu; Hidemasa Tamura; Hiromichi Taguchi; Hiroshi Yamanoi, and Yoshimi Makino, all of Yokohama, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Nov. 20, 1981, Ser. No. 323,457
Claims priority, application Japan, Nov. 29, 1980, 55-168190
Int. Cl.³ B32B *27/20, 27/36*
U.S. Cl. 428—143 7 Claims

1. A slide member having at least one surface against which a traveling magnetic record member is arranged to contact,

said slide member comprising a molded polymer composite material composed predominantly of a resinous composition and a granular inorganic filler material dispersed in said resinous composition,

said resinous composition containing about 20 to 70% by volume of an unsaturated polyester resin, about 1 to 25% by volume of a thermoplastic resin, and 30 to 70% by volume of a liquid monomer being capable of polymerizing with said unsaturated polyester resin,

said granular inorganic filler material having a particle size ranging from 1 to 100 microns and being present in said polymer composite material in an amount of from 40 to 65% by volume for 100% by volume of said resinous composition,

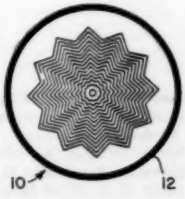
said slide member having a surface layer thereof removed so as to expose part of the surface of said granular inorganic filler material.

4,434,203

DIAPHRAGM

Dennis K. Briefer, Berlin, Mass., assignor to Setra Systems, Inc., Acton, Mass.

Filed Oct. 27, 1980, Ser. No. 200,790
Int. Cl.³ B32B *3/26, 3/28*
U.S. Cl. 428—152 26 Claims



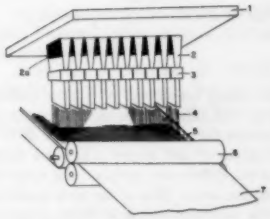
1. A diaphragm that flexes in a direction generally normal to said diaphragm in response to a pressure differential across the diaphragm, comprising: a generally thin diaphragm member formed of a structural material that is substantially inelastic, said diaphragm member including a low energy collapse pattern of wrinkles that extend over a substantial portion of the diaphragm, each of said wrinkles being elongated over a short length in any one direction and having an amplitude greater than the thickness of the diaphragm but not projecting substantially from the plane of said diaphragm, said low energy collapse pattern also being such that the angular orientation of said elongated wrinkles varies over said diaphragm member and any axis lying in the plane of said diaphragm intersects at least one wrinkle to thereby relieve stresses induced in said diaphragm member by said pressure differential, whereby said diaphragm is both radially and tangentially expandable with respect to any reference point in the central portion thereof.

4,434,204

SPUN-BONDED FABRIC OF PARTIALLY DRAWN POLYPROPYLENE WITH A LOW DRAPING COEFFICIENT

Ludwig Hartman; Ivo Ruzek, and Engelbert Löcher, all of Kaiserslautern, Fed. Rep. of Germany, assignors to Firma Carl Freudenberg, Weinheim an der Bergstrasse, Fed. Rep. of Germany

Filed Sep. 10, 1982, Ser. No. 416,700
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1981, 3151294
Int. Cl.³ D04H *1/58*
U.S. Cl. 428—198 6 Claims



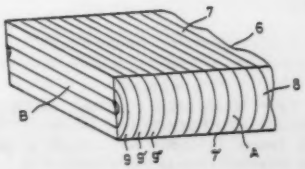
1. A spun-bonded fabric having a low draping coefficient, said fabric being comprised of polypropylene fibers which are endlessly spun in the form of a spun-bonded fabers, wherein the polypropylene fibers which comprise said fabric are partially drawn, have a maximum tensile elongation of at least about 200%, and have a fiber shrinkage determined in boiling water of less than about 10%.

4,434,205

ARTIFICIAL LEATHERS

Shigeo Fujii; Tokuzo Ikeda; Takashi Mikami, and Shuji Okano, all of Saitama, Japan, assignors to Toa Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 203,772, Nov. 3, 1980, abandoned, which is a continuation-in-part of Ser. No. 167,637, Dec. 21, 1979, Pat. No. 4,375,446, and Ser. No. 167,638, Dec. 21, 1979, abandoned. This application Jul. 22, 1982, Ser. No. 401,290
Claims priority, application Japan, Nov. 1, 1979, 54-14044
Int. Cl.³ B32B *7/02*
U.S. Cl. 428—218 21 Claims



1. An artificial leather comprising a nonwoven fabric and a polymer filling the interstices of said nonwoven fabric, said nonwoven fabric consisting essentially of stacked and intertwined melt-blown long fibers forming thin intertwined layers

extending between one surface of said nonwoven fabric or a part thereof and the other surface or a part thereof.

4,434,206

SHAPED ARTICLES OF POROUS CARBON FIBERS

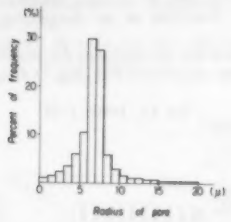
Hiroyuki Fukuda; Hisatsugu Kaji, both of Iwaki, and Hiroto Fujimaki, Kokubunji, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 15, 1982, Ser. No. 358,373

Claims priority, application Japan, Apr. 1, 1981, 56-48700

Int. Cl.³ B32B *9/00;* **D04H** *1/58*

U.S. Cl. 428—288 **10 Claims**



1. A shaped article comprised of porous carbon having a porosity of 50 to 85% and a compressive strength of more than 50 kg/cm² wherein the radii of not less than 60% of the total number of the pores of said shaped article are distributed in a range wherein the differences between the upper limit of the pore radius and the lower limit of the pore radius is not more than 20 microns, said shaped articles being prepared by:

(a) preparing lumps of a mixture of 100 parts by weight of carbonaceous fibers of 3 to 30 microns in diameter and less than 2 mm in length and 20 to 100 parts by weight of a resinous binder selected from the group consisting of phenolic resins and furfuryl alcohol resins;

(b) crushing the thus prepared mixture;

(c) adding to 100 parts by weight of the resultant crushed mixture 20 to 100 parts by weight of a granular substance which is soluble in a solvent, and wherein the radii of the particles occupying more than 70% of the weight of said granular substance are distributed in a range wherein the difference between the upper limit of the radius thereof and the lower limit of the radius thereof is not more than 30 microns;

(d) shaping the thus obtained mixture at an elevated temperature and under pressure;

(e) immersing the thus shaped mixture into a solvent which is capable of dissolving said granular substance, thereby removing said granular substance from the shaped mixture; and

(f) baking the thus treated mixture at an elevated temperature, thereby obtaining said shaped articles of porous carbon.

4,434,207

RADIATION HARDENED LIFT-OFF CORRECTION MEDIUM AND PROCESS OF MANUFACTURE

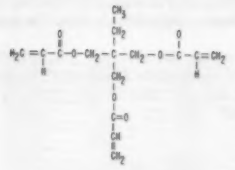
Terence E. Franey, Lexington, Ky., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 16, 1982, Ser. No. 419,101

Int. Cl.³ C09J *7/02*

U.S. Cl. 428—343 **20 Claims**

1. A lift-off correction medium having a supporting substrate and a layer of bonding material supported on said substrate, said bonding material bonding to printed characters upon impact of said supporting substrate to effect lift-off correction,



said bonding material comprising a polymerized triacrylate as a major solid material.

4,434,208

AQUEOUS, ADHESIVE COATING COMPOSITION WITH A NON-SELF-CROSSLINKABLE ELASTOMER FOR USE WITH FILAMENTARY MATERIALS

Mikhail M. Girgis, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 238,725, Feb. 27, 1981, Pat. No. 4,405,746. This application Aug. 30, 1982, Ser. No. 412,476

The portion of the term of this patent subsequent to Sep. 20, 2000, has been disclaimed.

Int. Cl.³ B32B *25/02, 27/04*

U.S. Cl. 428—378 **24 Claims**

1. Filamentary material coated with an aqueous adhesive coating composition, comprising:

A. A vinyl-pyridine-containing elastomeric latex selected from the group consisting of an elastomeric copolymer latex produced from a vinyl pyridine-containing monomer and 1,3-diene hydrocarbon monomer and an elastomeric terpolymer latex produced from vinyl pyridine-containing monomer, 1,3-diene hydrocarbon monomer and a vinyl-containing monomer,

B. phenolic aldehyde condensate polymer,

C. non-self-crosslinkable elastomeric latex having a gel content of less than 40% and an average particle size of less than around 2000 angstroms present in the coating composition in a predominant amount over the amount of the vinyl pyridine-containing copolymer or terpolymer,

D. carboxylated butadiene polymer or carboxylated butadiene-styrene copolymer present in the amount of about 0.5 to about 3 weight percent of the dried solids of the aqueous coating composition,

E. and water.

4,434,209

CAPACITOR

Tohru Sasaki; Mitsuru Ohta; Syuuzi Terasaki, and Syozo Kakizaki, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 1, 1981, Ser. No. 249,958

Claims priority, application Japan, May 19, 1980, 55-66312

Int. Cl.³ B32B *15/08, 27/06;* **N01G** *4/08*

U.S. Cl. 428—416 **5 Claims**

1. A capacitor having layers of dielectric material, at least one of said layers being an oriented plastic film obtained by stretching in at least one direction an unstretched film of a resin composition comprising a mixture of (a) a polyvinylidene fluoride and (b) at least one resin selected from the group consisting of a polycarbonate, a thermoplastic polyester, and a mixture thereof, the weight ratio of (a) to (b) being from 100:0.1 to 100:30 adjacent a metallic electrode layer.

4,434,210
MAGNETIC RECORDING MEDIUM

Kaoru Nakajima, Izumi; Yoshinobu Ninomiya, Miyagi, and Masashi Somezawa, Sendai, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jul. 2, 1981, Ser. No. 279,726
Claims priority, application Japan, Jul. 3, 1980, 55-90838
Int. Cl.³ H01F *10/02*
U.S. Cl. 428—447 3 Claims

1. A magnetic recording medium comprising a magnetic layer in which magnetic or magnetizable powder material surface-treated with a silicon compound having a silanol group and/or a silanol-forming group upon hydrolysis and a double-bond sensitive to radiation and a binder are present therein, said silicon compound having been sufficiently irradiated to form an enhanced binding between the magnetic or magnetizable powder material and the binder, and said silicon compound being bonded to said magnetic or magnetizable powder by a chemical reaction between the silanol group and the surfaces of said powder.

4,434,211
METHOD FOR BONDING CERAMIC TO NOBLE BASED METALS AND PRODUCT

Itzhak Shoher, 50 Shlomo Hamelech St., Tel-Aviv, and Aharon Whiteman, 13 I.L. Perez St., Pethah-Tikvah, both of Israel

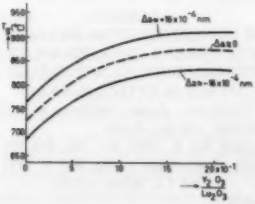
Continuation of Ser. No. 171,255, Jul. 22, 1980, abandoned, which is a division of Ser. No. 18,767, Mar. 8, 1979, abandoned. This application Jan. 14, 1983, Ser. No. 460,918
Int. Cl.³ B22F *3/00, 5/00, 7/00*
U.S. Cl. 428—552 7 Claims

6. A composite structure composed of a layer of a noble based metal, a layer of ceramic material and an intermediate layer of a material having a composition of from one to 100% by weight of finely divided particles of a noble metal halide and from zero to 99% by weight of finely divided substantially gold based metal particles formed by the method of sintering said intermediate layer at a predetermined temperature range of between 1700° F. to 1975° F. with said layer of ceramic material fired at between 1600° to 1820°.

4,434,212
DEVICE FOR PROPAGATING MAGNETIC DOMAINS

John M. Robertson; Dirk J. Breed, and Antonius B. Voermans, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 8, 1981, Ser. No. 281,270
Claims priority, application Netherlands, Jul. 11, 1980, 8004009
Int. Cl.³ G11C *11/02;* C04B *35/50*
U.S. Cl. 428—693 7 Claims



1. A device for propagating magnetic domains comprising:
a monocrystalline, nonmagnwetic substrate having a surface; and
a monocrystalline layer of an iron garnet epitaxially provided on the surface of the substrate, said layer having a uniaxial magnetic anisotropy induced substantially by growth;
characterized in that at the dodecahedral lattice sites, the iron garnet consists essentially of bismuth and at least one rare-earth ion, selected from the group consisting of lutetium, thulium, and ytterbium, in amounts which will produce a uniaxial magnetic anisotropy sufficiently high to enable the iron garnet layer to support magnetic domains having diameters of two microns or less.

4,434,213
LITHIUM ANODE

Aaron F. Niles, and Dennis P. Johnson, both of Madison, Wis., assignors to Rayovac Corporation, Madison, Wis.

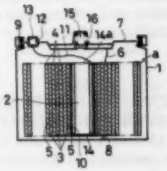
Filed May 13, 1982, Ser. No. 377,821
Int. Cl.³ H01M *6/16*
U.S. Cl. 429—3 8 Claims

1. In an improved lithium-organic electrolyte cell having a lithium salt dissolved in said electrolyte and having a separator facing the anode, the improvement which comprises the anode having a body of lithium initially cladded wih a cladding layer of aluminum-magnesium alloy, the cladding layer laminated to the face of the anode body adjacent to the separator, and a ternary aluminum-magnesium-lithium alloy formed on the surface of the anode body as a result of diffusion between the cladding layer and the anode body.

4,434,214
ALKALINE STORAGE BATTERY

Shogo Suzuki, Yamato, Japan, assignor to Furukawa Denchi Kabushiki Kaisha, Japan

Filed Nov. 5, 1982, Ser. No. 439,425
Claims priority, application Japan, Nov. 16, 1981, 56-182234
Int. Cl.³ H01M *10/34*
U.S. Cl. 429—59 6 Claims



1. An alkaline storage battery comprising a container containing a battery element comprising a positive electrode, a negative electrode, a separator and a gas ionizing auxiliary electrode, wherein the gas ionizing electrode is a hollow tube electrode and is located in a center hollow space of a wound battery element and the gas ionizing electrode and the wound battery element are separated by the bag of microporous film interposed therebetween.

4,434,215
BATTERY SEPARATOR

Walter R. Wszolek, Sykesville, and Joseph T. Lundquist, Jr., Columbia, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed Sep. 2, 1982, Ser. No. 414,004
Int. Cl.³ H01M *2/16*
U.S. Cl. 429—144 8 Claims

1. A composition suitable for forming a battery separator sheet product comprising a mixture of (a) a copolymer of ethylene and acrylic acid or methacrylic acid, said acid substantially neutralized with an alkali or alkaline earth metal cation and said copolymer having from 10 to 23 mole percent of said acid therein and having a standard load melt index of from 0 to 5; and (b) a copolymer of ethylene and acrylic acid or methacrylic acid, said acid substantially neutralized with an alkali or alkaline earth metal cation and said copolymer having at least about 25 mole percent of acrylic acid therein and having a standard load melt index of from about 10 to 100; the weight ratio of (a) to (b) being from 0.3 to 2.

4,434,216
SOLID STATE ELECTROLYTE

Ashok V. Joshi, Fishkill; Arun D. Jatkar, Goshen, both of N.Y., and William P. Sholette, Warminister, Pa., assignors to Rayovac Corporation, Madison, Wis.

Continuation of Ser. No. 200,278, Oct. 24, 1980, abandoned. This application Dec. 7, 1981, Ser. No. 327,884

Int. Cl.³ H01M 6/18

U.S. Cl. 429—191 **13 Claims**

1. A solid state electrolyte for use in a solid-state electrochemical cell having a lithium anode comprised in mole percent of about 10 to about 50% iodine moiety, about 8 to about 47% lithium moiety, about 3% to about 16% phosphate moiety, up to about 38% oxygen moiety not inclusive of oxygen contained in the phosphate radical and about 5 to about 30% of at least one moiety selected from the group of calcium and aluminum moieties, said electrolyte being in the form of an interdiffused body of sources of said moieties and said moieties being in stoichiometric relationship metallic to non-metallic.

4,434,217
CHALCOGENIDE PRODUCT

Joseph I. Masters, Lincoln, and Gershon M. Goldberg, Arlington, both of Mass., assignors to GCA Corporation, Bedford, Mass.

Division of Ser. No. 86,198, Oct. 17, 1979, Pat. No. 4,269,935, which is a continuation-in-part of Ser. No. 57,183, Jul. 13, 1979, abandoned. This application Jan. 5, 1981, Ser. No. 222,714

Int. Cl.³ G03C 5/24

U.S. Cl. 430—9 **1 Claim**

1. A unitary product comprising, as a substrate, a semiconductor body having a surface on which a micro pattern is to be imposed, a layer of chalcogenide glass material on said surface and, on the outer surface of said chalcogenide glass material, a silver image replicating said pattern, said silver image consisting primarily of metallic silver atoms in a silver halide matrix.

4,434,218
PHOTOSENSITIVE COMPOSITION FOR ELECTROPHOTOGRAPHY

Noriyoshi Tarumi; Akihiko Tamura, and Masakazu Kokiso, all of Tokyo, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 6,104, Jan. 24, 1979, abandoned, which is a continuation of Ser. No. 746,084, Nov. 30, 1976, abandoned. This application Jun. 3, 1981, Ser. No. 270,115

Int. Cl.³ G03G 5/04

U.S. Cl. 430—96 **15 Claims**

1. A photosensitive article comprising:

(1) a conductive substrate; and,

(2) an uppermost photosensitive layer which is a heat-dried coating of a photosensitive composition comprising an aqueous solution of a water-soluble prepolymer capable of forming a network structure by cross-linking, and a photoconductive compound selected from the group consisting of cadmium sulfide, cadmium selenide, cadmium sulfoselenide, zinc sulfide and zinc selenide.

4,434,219
ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MEMBER COMPRISING PHOTOCONDUCTIVE POWDER AND A DEIONIZED BINDER RESIN

Fumio Sumino, Kawakaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 10, 1982, Ser. No. 347,629

Claims priority, application Japan, Feb. 24, 1981, 56-25856

Int. Cl.³ G03G 5/10

U.S. Cl. 430—96 **6 Claims**

6. An electrophotographic photosensitive member including a photoconductive layer which layer comprises photoconductive particles dispersed in a resin binder, said resin binder formed from a material having a tendency to reduce the photoconductive properties of said photoconductive layer under the influence of heat, light or both, said resin binder being formed by washing the resin binder material in an aqueous solution containing at least one type of ion exchange resin to solubilize any ionic impurities from the surface of said resin binder material, and then separating said binder material from said solution, wherein said electrophotographic photosensitive member is rendered stable against deterioration of its photoconductive properties due to temperature and humidity effects.

4,434,220
ELECTROPHOTOGRAPHIC TONER AND CARRIER

Jerry J. Abbott; Stephen C. Crossan, both of Longmont; Sterritt R. Fuller, Jr., Boulder, and Paul D. Jachimiak, Lafayette, all of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 960,138, Nov. 13, 1978, abandoned. This application Jul. 15, 1982, Ser. No. 398,512

Int. Cl.³ G03G 9/10

U.S. Cl. 430—108 **17 Claims**

1. A developer mix of toner particles and carrier beads for use in electrostatic copying having magnetic brush development, comprising;

toner particles having a size distribution wherein less than 15% by weight are greater than 16 microns in size, from 7% to 15% by weight are less than 5 microns in size, the remainder being from 5 to 16 microns in size, the particles median size by weight being 8 to 12 microns in size; and

carrier beads having a magnetic core and a coating on said core, said coating having a resin system comprised of about 16% to about 20% by weight of polytetrafluoroethylene, about 9% to about 20% by weight fluorinated polyethylene-propylene, and about 59% to about 62% by weight of a poly (amide-imide) which is stable up to at least 600° F., triboelectrically negative, nonspalling, essentially nonwearing, dispersible with respect to the other resin components, and essentially nonfriable.

4,434,221
TONER CONCENTRATION DETECTION BY MEASURING CURRENT CREATED BY TRANSFER OF CARRIER COMPONENT TO NON-IMAGE AREAS OF IMAGE SUPPORT SURFACE

Tateki Oka, Toyokawa, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jul. 6, 1982, Ser. No. 395,305

Claims priority, application Japan, Jul. 3, 1981, 56-104892

Int. Cl.³ G03G 13/09

U.S. Cl. 430—122 **6 Claims**

1. A method of controlling toner concentration of an electrically insulative toner forming part of a magnetic developing material in an electrophotographic copying apparatus of a type in which the image region on the surface of an electrostatic latent image support member for supporting thereon an electrostatic latent image having a polarity opposite to the charge polarity of the electrically insulative toner, is developed by a magnetic brush of the magnetic developing material, the developing material being composed of a mixture of a high resis-

tance magnetic carrier having a volume resistivity of more than 10^{10} Ω-cm and the electrically insulative toner which are respectively triboelectrically charged to different polarities, and which copying apparatus has a developing bias source connected to a developing electrode so as to impress a developing bias having the same polarity as that of the electrostatic image on said developing electrode at least during the developing of the image region, said toner concentration control method comprising the steps of:

(a) utilizing part of the surface of said image support member outside the image region thereof as a carrier adhering region by, at the time said carrier adhering region passes said magnetic brush, forming an electric field between the surface of said image support member and said developing electrode in a direction for causing the carrier in the developing material forming the magnetic brush to be electrostatically attracted onto the carrier adhering region of said image support member and which electric field is opposite in direction to the field existing during image area development by the toner;

(b) developing said carrier adhering region by said magnetic brush for causing said carrier to adhere to said carrier adhering region during said developing;

(c) measuring the current flowing between said developing electrode and said image support member during said adhesion of said carrier to said carrier adhering region; and

(d) controlling the amount of toner supplied for replenishment of said magnetic developing material according to the value of the current thus measured.

4,434,222

METHOD OF FORMING INFRARED-SENSITIVE PHOTOCONDUCTORS OF CADMIUM SALT CRYSTALLITES

Mary J. Wegener, San Jose, and Morris Feinleib, Mountain View, both of Calif., assignors to Benson, Inc., San Jose, Calif.

Filed May 15, 1981, Ser. No. 263,953

Int. Cl.³ G03G *5/087*

U.S. Cl. 430—135 **8 Claims**

1. The method for forming a photoconductor having enhanced sensitivity to red and infrared wavelength regions comprising the steps of:

(a) forming a suspension of cadmium carbonate and sufficient cupric chloride to give up to approximately 2% copper atoms per cadmium atom;

(b) adding ammonia to said suspension;

(c) adding hydrogen sulfide gas to convert 50 to 80% of said cadmium carbonate to cadmium sulfide;

(d) adding sufficient cadmium salt to produce the prescribed percentage of cadmium selenide in step (e) and sufficient copper chloride to the conversion product of step (c) to maintain a level of copper doping in the final product of up to approximately 2% copper atoms per cadmium atom, and a source of ammonia to form a mixed slurry; and

(e) adding hydrogen selenide gas to the mixed slurry formed in step (d) to form a mixed precipitate including 50–20% cadmium carbonate, 50–80% cadmium sulfide and 0–20% cadmium selenide; and

(f) calcining the mixed precipitate from step (e) at a temperature and for a time in an inert atmosphere sufficient to remove volatiles, diffuse the copper dopant in the mixture and to form from 0.05 to 2.5% cadmium oxide in a resultant product of crystallites.

4,434,223

IMAGE-FORMING ELEMENT HAVING AN ALUMINUM LAYER ON A TRANSPARENT FILM BASE

Takeo Kohira; Takao Taguchi, both of Chiba; Takeo Sugiura, Tokorozawa, and Takatoshi Ohta, Warabi, all of Japan, assignors to Toppan Printing Co., Ltd., Tokyo and Okamoto Chemical Industry Co., Ltd., Saitama, both of, Japan

Filed Dec. 27, 1982, Ser. No. 452,919

Int. Cl.³ G03C *1/78*

U.S. Cl. 430—273 **16 Claims**

1. An image-forming element which comprises a transparent base film, an aluminum film deposited on the base film, and a photosensitive layer formed on the aluminum film and which can be developed with an alkali aqueous solution developer, characterized in that the photosensitive layer comprises (a) 20 to 60% by weight of a copolymer of a vinyl toluene and a monoester of an unsaturated dibasic acid, (b) 10 to 70% by weight of an addition-polymerizable, ethylenically unsaturated monomer which is an acrylate or a methacrylate of a fatty polyhydroxy alcohol having at least two terminal ethylene groups and at least one hydroxyl groups, and (c) 0.5 to 30% by weight of a photopolymerization initiator.

4,434,224

METHOD OF PATTERN FORMATION

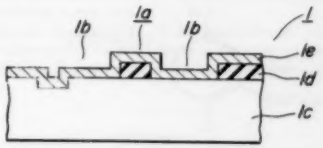
Akira Yoshikawa, Higashiyamato; Akitsu Takeda, Tokyo; Osamu Ochi, Sayama; Tomoko Hisaki, Tokyo, and Yoshihiko Mizushima, Fuchu, all of Japan, assignors to Nippon Telegraph & Telephone Public Corp., Tokyo, Japan

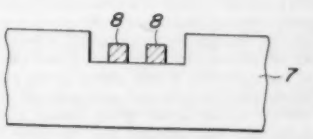
Filed Jan. 29, 1982, Ser. No. 343,908

Claims priority, application Japan, Feb. 6, 1981, 56-16613

Int. Cl.³ G03C *5/00*

U.S. Cl. 430—323 **18 Claims**





1. A method of pattern formation, which comprises the steps of:

forming an organic polymer resist material layer on the surface of a layer to be worked of a substrate;

exposing said organic polymer resist material layer with a first exposure pattern which relates to an alignment mark on said substrate;

developing the exposed organic polymer resist material layer to form a first desired pattern which does not cover said alignment mark;

applying a heat treatment to the patterned organic polymer resist material layer;

forming an inorganic resist material layer being a laminate consisting of a selenium-based glass material layer and a silver layer or layer containing silver on the organic polymer resist material layer thus heat-treated so as to cover the whole surface thereof and the whole exposed surface of said layer to be worked of the substrate material;

exposing said inorganic resist material layer with a second exposure pattern which relates to said alignment mark;
developing the exposed inorganic resist material layer to form a second desired pattern which does not cover said alignment mark;
etching to remove the organic polymer resist material layer in a region which is not covered with the patterned inorganic resist material layer;
applying an etching treatment to said layer to be worked in a region which is not covered with said organic polymer resist material layer; and
removing said inorganic and organic polymer resist material layers.

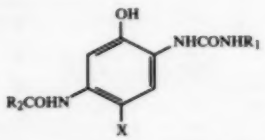
4,434,225
LIGHT-SENSITIVE SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL

Hiroshi Sugita; Yasuo Tsuda; Kenji Ito, and Satoru Shimba, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

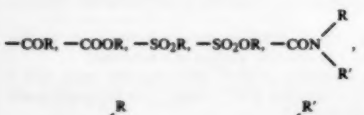
Filed Feb. 22, 1983, Ser. No. 468,395
Claims priority, application Japan, Feb. 24, 1982, 57-29556; Feb. 26, 1982, 57-30849; Feb. 27, 1982, 57-31888
Int. Cl.³ G03C *1/40*
U.S. Cl. 430—544 **28 Claims**

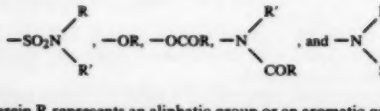
1. A light-sensitive silver halide color photographic material having at least one light-sensitive silver halide emulsion layer on a support, characterized in that said light-sensitive silver halide emulsion layer contains a cyan coupler represented by formula [I] shown below, and wherein at least one of said light-sensitive silver halide emulsion layer and a layer contiguous to said light-sensitive silver halide emulsion layer contains a non-timing type DIR compound:

Formula [I]



wherein X represents a hydrogen atom or a group capable of being eliminated by a coupling reaction with an oxidized product of an aromatic primary amine color developing agent; R_1 represents a naphthyl group or a heterocyclic group (provided that a carbon atom of said heterocyclic group is bonded to the ureido group), or a phenyl group having at least one substituent (with the proviso that when one of said substituents is a cyano at the p-position of said phenyl group relative to the ureido group, the four ortho and meta positions of said phenyl group relative to the ureido group cannot have hydrogen atoms at the same time) selected from the group consisting of a trifluoromethyl, nitro, cyano,



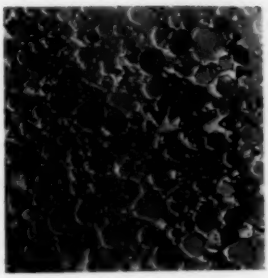


(wherein R represents an aliphatic group or an aromatic group, and R′ represents a hydrogen atom, an aliphatic group or an aromatic group); and R_2 represents an aliphatic group or an aromatic group necessary to impart diffusion resistance to the cyan dyes formed from the cyan couplers represented by formula [I] and the cyan dyes to be formed from said cyan coupler.

4,434,226
HIGH ASPECT RATIO SILVER BROMOIODIDE EMULSIONS AND PROCESSES FOR THEIR PREPARATION

Herbert S. Wilgus, Conesus, and John A. Haefner, Webster, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 320,905, Dec. 12, 1981, abandoned. This application Sep. 30, 1982, Ser. No. 429,420
Int. Cl.³ G03L *1/02*
U.S. Cl. 430—567 **22 Claims**



1. A high aspect ratio tabular grain silver halide emulsion comprised of a dispersing medium and silver bromoiodide grains, wherein tabular silver bromoiodide grains having a thickness of less than 0.3 micron and a diameter of at least 0.6 micron have an average aspect ratio of greater than 8:1 and account for at least 50 percent of the total projected area of said silver bromoiodide grains.

4,434,227
IMMUNOASSAY FOR CLASS SPECIFIC IMMUNOGLOBULIN ANTIBODIES

John T. Unger, Lindenhurst, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Filed Feb. 8, 1982, Ser. No. 346,662
Int. Cl.³ G01N *33/54*
U.S. Cl. 435—7 **21 Claims**

1. A method for determining an immunoglobulin antibody of an IgX class in a sample, wherein X is selected from the group consisting of M, A, D and E, comprising:
(a) treating the sample with an effective amount of anti-IgG;
(b) contacting the treated sample with a class specific antibody reagent comprising an antigen, for which the immunoglobulin antibody IgX is specific, coated on a solid support; to form an antigen-IgX complex on the solid support;
(c) removing unbound sample;
(d) treating the antigen-IgX complex with anti-IgX; and
(e) determining the anti-IgX bound to the antigen-IgX complex as a measure of IgX in the sample.

4,434,228
IMMOBILIZATION OF BIOLOGICAL MATERIALS IN CONDENSED POLYALKYLENEIMINE POLYMERS

Wayne E. Swann, Columbia, Md., assignor to Genex Corporation, Rockville, Md.

Filed Apr. 20, 1982, Ser. No. 370,242
Int. Cl.³ C12P *13/22, 13/20*; C12N *11/08, 11/04*
U.S. Cl. 435—108 **34 Claims**

25. An insolubilized biological material composite comprising a biologically active material immobilized within a condensed polyalkyleneimine polymer, wherein amino groups on the polyalkyleneimine chains are bridged by a polycarboxylic acid.

4,434,229

ENZYME IMMOBILIZATION WITH AN IMMOBILIZING REAGENT IN VAPOR PHASE

Shiro Nankai, Neyagawa; Ken-ichi Nakamura, and Takashi Iijima, both of Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Continuation of Ser. No. 152,149, May 21, 1980, abandoned. This application Mar. 16, 1982, Ser. No. 358,791

Claims priority, application Japan, May 21, 1979, 54-62472; Sep. 3, 1979, 54-112569

Int. Cl.³ C12N *11/00, 11/14, 11/06;* C12M *1/40*

U.S. Cl. 435—174 6 Claims

1. A method for the immobilization of an enzyme which comprises covering the surface of a solid support with an enzyme and, then immobilizing the enzyme on said support by contacting said enzyme with an immobilizing reagent selected from the group consisting of an aldehyde and a polymerized aldehyde provided in the vapor phase to cause an immobilizing reaction.

4,434,230

HUMAN NONSECRETORY PLASMACYTOID CELL LINE

Roy E. Ritts, Jr., Rochester, Minn., assignor to Research Corporation, New York, N.Y.

Filed Aug. 12, 1981, Ser. No. 292,277

Int. Cl.³ C12N *5/00, 5/02, 15/00;* C12R *1/91*

U.S. Cl. 435—240 6 Claims

1. A biologically pure cell culture comprising a continuous human, non-antibody-secreting, plasmacytoid cell line having ATCC deposit number CRL-8083 and clones or subclones thereof.

4,434,231

MEANS FOR EMBEDDING MICROORGANISMS IN A POLYMER MATRIX

Gerard Jung, Montlhery, France, assignor to Rhone-Poulenc Industries, Paris, France

Continuation of Ser. No. 136,329, Apr. 1, 1980, abandoned. This application Aug. 14, 1981, Ser. No. 293,441

Claims priority, application France, Apr. 5, 1979, 79 08597

Int. Cl.³ C12N *1/20*

U.S. Cl. 435—253 18 Claims

1. A process for producing a dry, stable, storable, and biologically-active product of microorganisms embedded in matrix of a polymer gel comprising the steps of forming a polymer gel by combining at least one polymer selected from the group of the polysaccharides with a biologically-active microorganism-containing composition and at least partially cross-linking said polymer, said cross-linking embedding said microorganisms in the matrix of said polymer gel; and drying said polymer gel, said drying not converting the microorganisms embedded in said polymer gel to a dormant or latent state.

4,434,232

MEASURING VESSELS ANALYSIS UTILIZING FIXED ENZYME

Takashi Tabara, Hachioji, Japan, assignor to Olympus Optical Company Limited, Tokyo, Japan

Filed Jul. 7, 1981, Ser. No. 281,216

Claims priority, application Japan, Jul. 9, 1980, 55-93569

Int. Cl.³ C12M *1/40, 1/34*

U.S. Cl. 435—288 15 Claims

1. A measuring vessel for analysis utilizing a fixed enzyme, said vessel comprising an inner wall surface at least a part of which is provided with at least one fixed enzyme, and an impervious bottom member movable substantially vertically within the vessel for locating liquid in the vessel at a predetermined level within the vessel.

4,434,233

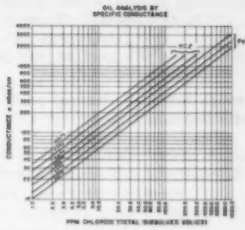
METHOD OF TESTING OIL FOR IONIC CONTAMINANTS

Joseph A. Bzdula, Fulton, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Mar. 3, 1981, Ser. No. 239,920

Int. Cl.³ G01N *27/06*

U.S. Cl. 436—60 13 Claims



1. A method of testing oil for ionic contamination which comprises the steps of:

isolating a sample of the oil to be tested;

mixing the oil sample with an approximately equal weight of distilled water to dissolve ionic contaminants in the oil sample into the distilled water;

separating a portion of the water with the ionic contaminants dissolved therein from the oil sample;

filtering the separated portion of contaminated water to remove residual oil from this portion of the contaminated water;

determining the conductivity of the separated portion of the contaminated water; and

comparing the conductivity of the contaminated water to the conductivity of distilled water at the same temperature to determine the overall level of ionic contamination of the oil.

4,434,234

METHOD AND KIT FOR SILVER STAINING SUBSTANCES SUPPORTED IN MATRIX

Lonnie D. Adams, Gobles, and David W. Sammons, Kalamazoo, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 250,512, Apr. 2, 1981, abandoned. This application Jun. 9, 1982, Ser. No. 386,505

Int. Cl.³ G01N *33/68*

U.S. Cl. 436—86 15 Claims

1. A method for silver staining a substance supported in a matrix, comprising:

(a) equilibrating said substance in an aqueous silver salt solution;

(b) rinsing said substance in water;

(c) subjecting said substance to a reducing solution; and

(d) immersing said substance in a first, then a second aqueous carbonate or aqueous sulfate salt solution.

4,434,235

METHOD AND APPARATUS FOR DETECTING NITRITE IONS IN FLUIDS

Tavassa Rabi, and Eugen Szekely, both of Beer Sheva, Israel, assignors to Ben Gurion University of the Negev Research and Development Authority, Beer Sheva, Israel

Filed Jan. 12, 1982, Ser. No. 338,837

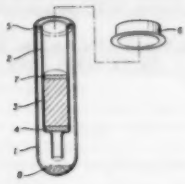
Claims priority, application Israel, Jan. 21, 1981, 61951

Int. Cl.³ G01N *33/52, 33/84*

U.S. Cl. 436—110 13 Claims

1. A method for detecting the presence of nitrite ions in fluids comprising pretreating nitrite containing fluids to en-

hance the detectability of the nitrite ions therein with a nitrite detecting reagent, said pretreatment step comprising passing



said fluid through activated charcoal prior to combination with said nitrite detection reagent.

4,434,236

IMMUNOASSAY WHEREIN LABELED ANTIBODY IS DISPLACED FROM IMMOBILIZED ANALYTE-ANALOGUE

J. William Freytag, Wilmington, Del., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Filed Oct. 20, 1982, Ser. No. 435,454

Int. Cl.³ G01N *33/54, 33/56, 33/58*

U.S. Cl. 436—512 **10 Claims**

1. A method for determining the amount of an analyte in a liquid sample, comprising the following steps:

(1) contacting a liquid sample suspected of containing analyte with a solid phase having immobilized thereon an analyte-analogue to which there is displaceably bound a labeled, anti-analyte antibody in molar excess over the analyte, wherein the dissociation constant between said antibody and the analyte-analogue is greater than the dissociation constant between said antibody and the analyte, whereby said antibody is displaced from the immobilized analyte-analogue as said antibody forms a complex with the analyte from the liquid sample;

(2) separating said complex from the solid phase; and

(3) measuring the amount of said complex which is related to the amount of analyte initially present in the liquid sample.

4,434,237

HUMAN LEUKOCYTIC PYROGEN TEST FOR THE DETECTION OF EXOGENOUS FEVER-PRODUCING SUBSTANCES

Charles A. Dinarello, 133 Mt. Vernon St., Boston, Mass. 02108

Filed Mar. 31, 1982, Ser. No. 363,839

Int. Cl.³ G01N *33/56*

U.S. Cl. 436—542 **48 Claims**

1. A method for determining the pyrogenicity of a substance, comprising the step of:

incubating said substance in the presence of a cell mixture for at least 46 hours at 35° to 39° C., wherein said cell mixture comprises human lymphocytes and human monocytes with a cell ratio of lymphocytes to monocytes of at least 2:1 and a composition with respect to the total of all cells present comprising at least 15% monocytes and no more than 10% granulocytes and wherein said cells have a cell contact ratio of from 0.0 to 0.75.

4,434,238

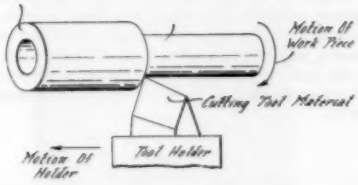
CERAMIC CUTTING TOOL FORMED FROM Si_3N_4—Y_2O_3—SiO_2 AND METHOD OF MAKING

Andre Ezis, Grosse Ile; Shyam K. Samanta, Ypsilanti, and Krishnamoorthy Subramanian, Inkster, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 232,754, Feb. 9, 1981, which is a continuation-in-part of Ser. No. 911,256, May 31, 1978, abandoned. This application Nov. 16, 1981, Ser. No. 321,837

Int. Cl.³ C04B *35/58*

U.S. Cl. 501—98 **4 Claims**



1. A unitary silicon nitride comprising ceramic formed from about 4% to about 12% by weight Y_2O_3 and the remainder consisting of Si_3N_4 and a minor amount of SiO_2, wherein the Y_2O_3/SiO_2 weight ratio is at least about 1.6 and which has intergranular crystalline secondary phases consisting essentially of $YSiO_2N$, $Y_{10}Si_7N_4O_{23}$ and $Y_2Si_2O_7$, with the $YSiO_2N$ phase comprising at least 25% by volume of said secondary phases.

4,434,239

PROCESS FOR MANUFACTURING CORDIERITE COMPOSITIONS

Pierre C. Aitcin, Sherbrooke, Canada, assignor to Universite De Montreal, Quebec, Canada

Filed Feb. 18, 1983, Ser. No. 467,882

Claims priority, application Canada, Feb. 19, 1982, 396,606

Int. Cl.³ C04B *35/04, 35/18, 35/20*

U.S. Cl. 501—118 **1 Claim**

1. Process for the manufacture of industrial cordierite ceramic units containing from 45 to 68% by weight of silica 16 to 37% by weight of magnesia and 12 to 45% by weight of alumina which comprises

(a) mixing from 15 to 60% by weight of the non-magnetic fraction of asbestos tailings having a $MgO:SiO_2$ ratio of from 0.8 to 1.25 with 40 to 85% of a kaolin clay by weight and 0 to 10% of alumina;

(b) shaping said mixture in green unit forms;

(c) curing said units at room temperature for 24 h then at 110° C. for 24 h;

(d) firing said cured units at a temperature of from 1350°–1400° C.

4,434,240

RECOVERY OF NOBLE METAL VALUES FROM CARBONYLATION RESIDUES

Joseph Pugach, Ho-Ho-Kus, N.J., assignor to The Halcon SD Group, Inc., New York, N.Y.

Filed Nov. 16, 1981, Ser. No. 321,362

Int. Cl.³ B01J *31/40, 23/96;* **C07C** *51/10;* **C01G** *55/00*

U.S. Cl. 502—24 **10 Claims**

1. A process for recovering rhodium from the high molecular weight residues containing organic carbonyl and acetate functions formed in rhodium-lithium catalyzed carbonylation reactions in which esters and ethers are combined with carbon monoxide in the presence of iodides to form anhydrides consisting essentially of:

(a) separating and concentrating said residue from the carbonylation reaction mixture;

(b) treating the separated and concentrated residue of (a) with a reagent capable of precipitating a solid containing substantially all the rhodium content of said residue and consisting of at least one member of the group consisting of alkali metal peroxides, alkali metal hydroxides, alkali metal borohydrides, acidified sodium bisulfate and formaldehyde;

(c) separating substantially all of the precipitated solid of (b).

2. A process of claim 1 further comprising: (d) returning said solid to the carbonylation reaction mixture for reuse.

3. A process of claim 2 wherein said separated solid is treated with an aqueous solution of hydrogen peroxide to concentrate the rhodium values.

4,434,241

CATALYST RECOVERY PROCESS FROM TAR FROM CARBONYLATION REACTIONS

Thomas H. Larkins, Jr., Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 27, 1982, Ser. No. 424,727

Int. Cl.³ B01J *31/40, 23/96, 27/32;* **C07C** *51/12*

U.S. Cl. 502—24 **4 Claims**

1. A process for the recovery of rhodium, lithium, and iodine values from tar which is generated during carbonylation reactions comprising the steps of:

(a) vaporizing volatile components from said tar;

(b) adding water to the remaining tar and heating the resulting mixture so as to extract corrosion metal ions and lithium ions into the aqueous phase;

(c) separating said aqueous phase;

(d) drying the resulting tar residue and leaching said residue with acetic acid at reflux temperature so as to remove iodine species, soluble organic polymers, and corrosion metal ions from said residue;

(e) burning said residue at a temperature and for a period of time sufficient to remove carbonaceous impurities therefrom; and

(f) recycling the rhodium-enriched residue to the reaction process.

2. The process of claim 1 which comprises the additional steps of concentrating the acetic acid leachate and burning the resulting concentrate; scrubbing the off-gas from said burning step with aqueous alkali hydroxide; adding sulfuric acid to the resulting iodide-containing alkali hydroxide solution; and heating the resulting sulfuric acid solution so as to distill and recover HI/I_2.

4. A process for the recovery of rhodium, lithium, and iodine values from tar which is generated durin the carbonylation of methyl acetate to acetic anhydride comprising the steps of:

(a) vaporizing volatile components from said tar;

(b) adding water to the remaining tar and heating the resulting mixture so as to extract corrosion metal ions and lithium ions into the aqueous phase;

(c) separating said aqueous phase;

(d) evaporating water from said aqueous phase and recycling the resulting lithium-rich residue to the reaction process;

(e) drying the tar residue from the water extraction step and leaching said residue with acetic acid at reflux temperature so as to remove iodine species, soluble organic polymers, and corrosion metal ions from said residue;

(f) burning said residue at a temperature and for a period of time sufficient to remove carbonaceous impurities therefrom;

(g) recycling the rhodium-enriched residue to the reaction process;

(h) concentrating the acetic acid leachate and burning the resulting concentrate;

(i) scrubbing the off-gas from said burning step with aqueous alkali hydroxide;

(j) adding sulfuric acid to the resulting iodide-containing alkali hydroxide solution; and

(k) heating the resulting sulfuric acid solution so as to distill and recover HI/I_2.

4,434,242

POLYMERIZATION CATALYST

Paul V. Roling, Spring, Tex.; Richard L. Veazey, East Windsor, and David E. Aylward, Madison, both of N.J., assignors to Cities Service Co., Tulsa, Okla.

Filed Nov. 24, 1982, Ser. No. 444,288

Int. Cl.³ C08F *4/68*

U.S. Cl. 502—107 **25 Claims**

1. A catalyst composition consisting essentially of the product obtained by:

(1) drying an inorganic oxide having surface hydroxyl groups to form a support that is substantially free of adsorbed water,

(2) reacting the surface hydroxyl groups of the support with at least a substantially stoichiometric amount of at least one organometallic compound corresponding to the formula $R_xMR'_yR''_z$, wherein M is a metal of Group III of the periodic table, R is an alkyl group containing 1 to 12 carbon atoms, R' and R'' are independently selected from the group consisting of H, Cl, and alkyl and alkoxy groups containing 1 to 12 carbon atoms, x has a value of 1 to 3, and y and z both represent values of 0 to 2, the sum of which is not greater than 3-x,

(3) reacting the thus-treated support with at least about 0.001 mol, per mol of organometallic compound, of at least one vanadium compound corresponding to a formula selected from $(RO)_nVOX_{3-n}$ and $(RO)_mVX_{4-m}$, in which formulas R represents a C_1–C_{18} monovalent hydrocarbon radical that is free of aliphatic unsaturation, X is Cl or Br, n has a value of 0 to 3, and m has a value of 0 to 4, and

(4) reacting the product of step 3 with at least about 0.1 mol, per mol of organometallic compound, of an ether-alcohol corresponding to the formula $R''[OCHR'(CH_2)_nCHR-]_mOH$, wherein R and R' are independently selected from the group consisting of hydrogen and alkyl groups containing 1–18 carbon atoms, R'' is a hydrocarbyl group, n has a value of 0 to 16, and m has a value of at least 1.

4,434,243

AQUEOUS TITANATION OF CATALYST SUPPORT CONTAINING CHROMIUM WITH SOLUBILIZED $Ti(OR)_4$

Joel L. Martin, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 9, 1982, Ser. No. 356,582

Int. Cl.³ B01J *21/06, 23/86, 31/12*

U.S. Cl. 502—171 **14 Claims**

1. A method comprising:

(a) reacting a titanium hydrocarbyloxide of the formula $Ti(OR)_4$ wherein R is a hydrocarbyl radical, with a polyhydroxy organic compound to give a reaction product, a mole ratio of said polyhydroxy organic compound to said titanium hydrocarbyloxide being above 2;

(b) combining the thus formed product with an aqueous solution of a strong acid at a temperature of 30° C. or below to form a water soluble titanium composition, a mole ratio of said titanium hydrocarbyloxide to said acid being within the range of 0.25:1 to 2:1; and

(c) combining said water soluble titanium composition while in solution with an inorganic catalyst support and a chromium compound.

4,434,244
MALEIC ANHYDRIDE CATALYST RECYCLE

George E. Kuhlmann, Naperville, and Stephen V. Hoover, Aurora, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

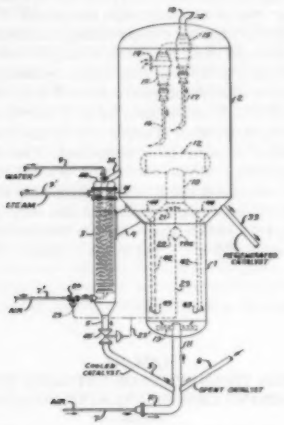
Filed Jun. 7, 1982, Ser. No. 385,794
Int. Cl.³ B01J 27/14
U.S. Cl. 502—209 12 Claims

1. In a process for the production of phosphorus-vanadium-oxide catalyst in an organic reaction medium wherein the ratio of phosphorus to a vanadium is in the range of about 1.2:1 to about 1.8:1 the improvement comprising adding H_3PO_4 immediately after the vanadium reduction has terminated and recycling mother liquor comprising at least 15 weight percent ortho xylene remainder being orthophosphoric acid and aliphatic alcohol and thus recovering up to ninety percent of the vanadium.

4,434,245
FLUID PARTICLE COOLING PROCESS AND APPARATUS

David A. Lomas, Arlington Heights, and Gregory J. Thompson, Waukegan, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 273,296, Jun. 15, 1981, Pat. No. 4,353,812. This application Aug. 30, 1982, Ser. No. 413,047
The portion of the term of this patent subsequent to Oct. 12, 1999, has been disclaimed.
Int. Cl.³ B01J 21/20, 29/38; C10G 11/18; F27B 15/08
U.S. Cl. 502—2 5 Claims



1. A process for the controlled cooling of hot fluidized catalysts which comprises:

(a) passing spent catalyst having coke deposited thereon, cooled catalyst and regeneration gas containing oxygen to the lowermost portion of a catalytic combustion chamber to oxidize said coke in a relatively dense bed of fluidized catalyst;

(b) passing said oxidized catalyst upward through said combustion chamber to an uppermost section of said combustion chamber containing catalyst in a relatively dilute phase;

(c) passing said oxidized catalyst through said uppermost section of said combustion chamber to a surmounted disengagement chamber having a relatively dense phase of catalyst collecting in the lowermost portion of said disengagement chamber;

(d) passing said catalyst from said lowermost portion of said disengagement chamber to a heat removal zone situated extrinsic from said combustion and said disengagement chamber;

(e) cooling said catalyst in said extrinsic heat removal zone by indirect heat exchange against a cooling fluid entered and removed from said extrinsic heat exchange zone;

(f) fluidizing said catalyst in said heat exchange zone by passage of a fluidizing gas in direct contact with said catalyst being cooled;

(g) passing said cooled catalyst to said combustion chamber as the cooled catalyst of step (a), wherein said extend of fluidization in step (f) and said temperature of said regeneration system is controlled by the combination of:

(i) sensing a temperature in the uppermost section of said combustion chamber having catalyst in said relatively dilute phase;

(ii) transmitting said sensed temperature to a temperature controller device wherein said temperature is compared with a predetermined desired temperature set point to develop a controller output signal;

(iii) transmitting said controller output signal to a flow regulation means which regulates the quantity of flow of fluidizing gas in step (f) to said extrinsic heat exchange zone; and

(iv) transmitting said controller output signal to a flow regulation means which regulates the quantity of flow of cooled catalyst from said extrinsic heat exchange zone to said combustion chamber as said cooled catalyst of step (a).

4. The process of claim 1 wherein said cooling fluid of step (e) comprises water.

5. The process of claim 4 wherein said water cooling fluid changes from liquid to gas phase while absorbing heat in said heat exchange means.

4,434,246
PROCESS FOR PREPARING ETHYLENE GLYCOL AND LOWER MONOHYDRIC ALCOHOLS FROM SYNGAS USING A NOVEL CATALYST SYSTEM

Leslie H. Simons, Austin, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Feb. 1, 1982, Ser. No. 344,259
Int. Cl.³ C07C 27/06
U.S. Cl. 518—700 18 Claims

1. A process for preparing ethylene glycol and lower monohydric alcohols from syngas which comprises contacting a mixture of carbon monoxide and hydrogen with a catalyst system comprising a ruthenium-containing compound and a substituted aromatic hydrocarbon compound wherein the substituted aromatic hydrocarbon compound is a member of the group consisting of (1) mononuclear and polynuclear aromatic hydrocarbon compounds substituted on at least one ring carbon atom with an alkyl, alkenyl, cycloalkenyl or cycloalkyl group, and (2) mononuclear and polynuclear aromatic hydrocarbon compounds substituted on at least one ring carbon atom with a halogen atom, the ruthenium-containing compound and the substituted aromatic hydrocarbon compound being dispersed in a low melting quaternary phosphonium bromide, wherein the ruthenium-containing compound, substituted aromatic hydrocarbon and quaternary phosphonium salt are utilized in a mole ratio of ruthenium containing compound 1 to 4 moles, substituted aromatic hydrocarbon 1 to 10 moles and the phosphonium salt 20 to 50 moles, and heating the resulting mixture at a temperature of 150° C. to 350° C. and a pressure of 500 psi to 5500 psi for sufficient time to produce the desired ethylene glycol and monohydric alcohols.

4,434,247

CONTINUOUS PROCESS FOR THE MANUFACTURE OF ETHYLENE GLYCOL

Bernard D. Dombek, Charleston, W. Va., assignor to Union Carbide Corporation, Danbury, Conn.

Continuation of Ser. No. 190,988, Sep. 26, 1980, abandoned, which is a continuation-in-part of Ser. No. 91,242, Nov. 15, 1979, abandoned, which is a continuation-in-part of Ser. No. 971,667, Dec. 21, 1978, abandoned, and Ser. No. 971,816, Dec. 21, 1978, abandoned. This application Mar. 16, 1982, Ser. No. 358,703

Int. Cl.³ C07C *27/06*

U.S. Cl. 518—700 **34 Claims**

1. The continuous process for making the products methanol, ethylene glycol and ethanol, directly from the reaction of hydrogen and carbon monoxide, which comprises:

(a) establishing and maintaining within a reaction zone a solvent-containing liquid phase comprising solubilized ruthenium carbonyl complex in which the solvent has a dielectric constant of at least 2, determined at 25° C. or at its melting point, which ever is higher;

(b) continuously supplying hydrogen and carbon monoxide in said liquid phase;

(c) maintaining said liquid phase for a sufficient period of time at a temperature and pressure which causes said hydrogen and carbon monoxide to react to produce such products and ethylene glycol further reacts to form ethylene glycol reaction products, said temperature is between about 50° C. and 400° C. and said pressure is between about 500 psia (35.15 kg/cm^2) and 15,000 psia (1,054.6 kg/cm^2); and

(d) repeatedly removing said liquid phase from the reaction zone before the concentration of (i) ethylene glycol exceeds 20 wt. % of said liquid phase and (ii) ethylene glycol reaction products exceed 50 wt. % of the total ethylene glycol and ethylene glycol reaction products produced in said liquid phase.

4,434,248

PROCESS FOR PREPARING ALKANOLS FROM SYNTHESIS GAS

Jiang-Jen Lin, Round Rock, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Sep. 29, 1982, Ser. No. 426,317

Int. Cl.³ C07C *29/15, 27/06*

U.S. Cl. 518—700 **22 Claims**

1. A process for making alkanols which comprises reacting a mixture of CO and H_2 at a pressure of about 500 psig or greater and at a temperature of at least 150° C. in the presence of a catalyst system comprising a ruthenium-containing compound, a material selected from the group consisting of a nickel-containing compound or an iron-containing compound and a quaternary phosphonium salt, in the presence of an inert, oxygenated solvent.

4,434,249

METHOD OF PREPARING ACRYLIC ION-TRANSFER MEMBRANES

Cindy L. Ballestrasse, Seattle, and Robert T. Ruggeri, Kirkland, both of Wash., assignors to Electrochemical Technology Corp., Seattle, Wash.

Filed Jun. 28, 1982, Ser. No. 392,731

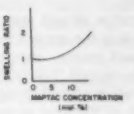
Int. Cl.³ B01J *47/12*

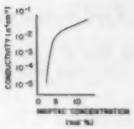
U.S. Cl. 521—27 **22 Claims**

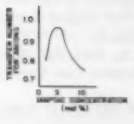
1. A process for forming ion-transfer membranes which comprises the following steps in sequence:

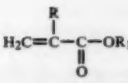
preparing a reaction mixture consisting essentially of:

(A) a major, non-ionic component selected from the group consisting of a hydrophobic acrylic monomer having the formula:



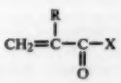






where R is H or CH_3 and R_1 is methyl, ethyl or butyl, and mixtures of two or more of said hydrophobic monomers;

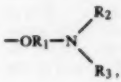
(B) a minor, ionogenous acrylic monomer component selected from the group consisting of: (i) acrylic acid; (ii) methacrylic acid; (iii) monomers represented by the formula:

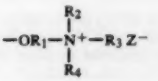


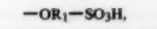
wherein:

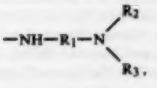
R is H or CH_3,

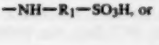
and X is

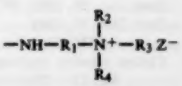












R_1 is alkylene or hydroxyalkylene

R_2, R_3 and R_4 are hydrogen, alkyl, or hydroxyalkyl, and Z^- is a halide, acetate, or methyl sulfate ion; and, (iv) mix-

tures of two or more of said ionogenous acrylic monomers; and

(C) an organic solvent,

wherein the concentration of said major, non-ionic component in said solvent is in the range 2.5 to 7.5 molar, and the concentration of said minor, ionogenous component in said solvent is in the range 0.10 to 0.75 molar, and wherein the molar concentration of said ionogenous component is between 3 and 12% of the total monomer content in said reaction mixture;

depositing a thin film of said reaction mixture on a substrate; and

heating said deposited film in a substantially oxygen-free environment at a temperature between 55 degrees C. and 80 degrees C.

4,434,250

POROUS TUBING

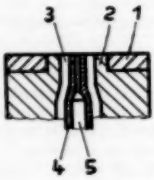
Erich Kessler, Hoechst, Fed. Rep. of Germany, assignor to Akzo N.V., Arnhem, Netherlands

Filed Dec. 29, 1981, Ser. No. 335,393

Claims priority, application Fed. Rep. of Germany, Dec. 31, 1980, 3049557

Int. Cl.³ B29D *27/00*; B29F *3/04*

U.S. Cl. 521—64 **19 Claims**



1. Method for the production of porous tubing, comprising extruding a homogeneous mixture of at least two components, one component a thermoplastic meltable polymer and the other component a liquid inert in relation to the polymer, both components forming a binary system which in liquid aggregate state displays a range of complete miscibility and a range with a miscibility gap, at a temperature above the separation temperature, substantially vertically upwardly without horizontal expansion using a annular slot nozzle and blowing of gas or dosing-in of liquid into the interior of the nozzle, into a bath of a cooling medium, the temperature of said bath being below the separation temperature of the homogeneous mixture, allowing the tubing to solidify, and lixiviating the liquid of the tubing.

15. Porous polymer tubing produced by the method according to claim 1, having a wall thickness between about 0.5 and 2.5 mm and an outer diameter between about 2.5 and 25 mm.

4,434,251

CROSS-LINKED POLYVINYL CHLORIDE RESIN FOAM AND METHOD OF MANUFACTURING THE SAME

Junnosuke Sasajima; Hiroshi Nagai; Kenji Mogi, all of Hiratsuka; Akio Nojiri, and Naonori Shiina, both of Tokyo, all of Japan, assignors to The Furukawa Electric Co., Ltd., Tokyo, Japan

PCT No. PCT/JP81/00128, § 371 Date Jan. 25, 1982, § 102(e) Date Jan. 25, 1982, PCT Pub. No. WO81/03461, PCT Pub. Date Dec. 10, 1981

PCT Filed Jun. 4, 1981, Ser. No. 346,039

Claims priority, application Japan, Jun. 4, 1980, 55-75144

Int. Cl.³ C08J *9/10*; B01J *1/10*; B29D *27/00*

U.S. Cl. 521—75 **12 Claims**

1. A method of continuously manufacturing a cross-linked polyvinyl chloride resin foam sheet which comprises:

a first step of mixing polyvinyl chloride resin with a plasticizer, a stabilizer, a cross-linking promoter and a blowing agent comprising substep (a) mixing said polyvinyl chloride resin, said plasticizer and said stabilizer at the gelling temperature of the resin to form a gelated mixture and substep (b) thereafter adding and uniformly admixing a blowing agent to the gelated mixture at a temperature at which said blowing agent does not decompose, and adding said cross-linking promoter so that it is mixed with said polyvinyl chloride resin, plasticizer and stabilizer in substep (a) or is added after said gelated mixture has been formed and admixed in said substep (b), and continuously forming the gelated mixture into a sheet by extruder or calender roll at a temperature at which said blowing agent does not decompose;

a second step of irradiating said sheet with ionizing radiation; and

a third step of thermally foaming the cross-linked sheet to continuously form said foamed sheet.

4,434,252

RIGID POLYVINYL CHLORIDE FOAM

Antoon Dorrestijn, Grevenbicht; Pieter J. Lemstra, Brunssum, and Lambert H. T. Van Unen, Heerlen, all of Netherlands, assignors to Stamicarbon B.V., Geleen, Netherlands

Continuation of Ser. No. 256,668, Apr. 22, 1981, abandoned. This application Dec. 14, 1982, Ser. No. 449,647

Claims priority, application Netherlands, Apr. 26, 1980, 8002463; Apr. 26, 1980, 8002464

Int. Cl.³ C08J *9/14*

U.S. Cl. 521—134 **10 Claims**

1. New rigid polyvinyl chloride foam having a density of less than 200 kg/m^3 and having a uniform, fine-celled cell-structure with closed cells of which at least 95% have a cell diameter of at most 300 μm, consisting of a rigid vinyl chloride homopolymer containing per 100 parts by weight of polyvinyl chloride 0.1–15 parts by weight of a homo- or copolymer of an alkyl methacrylate having an alkylgroup of 1–10 carbon atoms having a viscosity of the solution $\eta_{0.1}$ of between 1×10^{-6} and 4×10^{-6} m^2/s measured at 293 K in 1,2 dichloro ethylene and foamed by use of a physical blowing agent.

4,434,253

LOW DENSITY CLOSED-CELL FOAMED ARTICLES FROM ETHYLENE COPOLYMER/VINYL OR VINYLIDENE HALIDE BLENDS

John Rys-Sikora, Bel Aire, Md., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del. and Bata Shoe Company, Ontario, Canada

Division of Ser. No. 424,449, Sep. 27, 1982, Pat. No. 4,391,923. This application Feb. 22, 1983, Ser. No. 468,582

Int. Cl.³ C08J *9/00*; C08L *81/00*

U.S. Cl. 521—134 **16 Claims**

1. A closed-cell foamed article comprising a crosslinked blend of

(a) 5 to 95 weight percent based on the blend of a copolymer of

(i) ethylene;

(ii) 1 to 60 weight percent based on copolymer of a softening monomer selected from the group consisting of unsaturated mono- or dicarboxylic acids of 3–20 carbon atoms, esters of said unsaturated mono- or dicarboxylic acids, vinyl esters of saturated carboxylic acids where the acid group has 2–18 carbon atoms, vinyl alkyl ethers wherein the alkyl group has 1–18 carbon atoms, vinyl or vinylidene halides, acrylonitrile, methacrylonitrile, norbornene, alpha olefins of 3–12 carbon atoms and vinyl aromatic compounds; and

(iii) 1 to 30 weight percent based on copolymer of a member of the group consisting of carbon monoxide or sulfur dioxide;

(b) 5 to 95 weight percent of a vinyl or vinylidene halide polymer.

4,434,254
Patent Not Issued For This Number

4,434,255
METHOD OF UTILIZING GLASS FIBERS IN COMPOSITE GASKET STRUCTURES

Clarence W. Charon, Newark, and Kenneth E. Reid, Columbus, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Apr. 21, 1982, Ser. No. 370,654
Int. Cl.[3] C08K 9/10
U.S. Cl. 523—209 1 Claim

1. A method of producing a sheet material consisting of clay, glass fibers and a latex resin which comprises:

a. forming a slurry of particulate clay, a latex resin and a surfactant;

b. adjusting the pH of said slurry to form a second slurry and to encapsulate the clay in the resin and in an outer film of the surfactant;

c. adding glass fibers to the second slurry to form a third slurry; and,

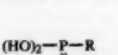
d. pressing said third slurry to force said clay through said latex and said film of surfactant to produce a cohesive sheet.

4,434,256
PAINT BINDERS

Gert Dworak, and Werner Staritzbichler, both of Graz, Austria, assignors to Vianova Kunstharz, A.G., Werndorf, Austria

Continuation of Ser. No. 87,345, Oct. 23, 1979, abandoned. This application Aug. 10, 1982, Ser. No. 406,859
Claims priority, application Austria, Oct. 31, 1978, 7763/78
Int. Cl.[3] C08G 59/40; C08L 63/00
U.S. Cl. 523—402 9 Claims

1. Paint binders comprising an aqueous solution formed by the neutralization of the reaction product obtained by slowly adding a polyepoxide containing reactive oxirane groups dissolved in an inert solvent to an aqueous solution of a phosphonic acid, said aqueous solution containing about 0.12 to 1 mole of phosphonic acid per mole of oxirane group, with a base selected from the group consisting of alkali hydroxides, ammonia, aliphatic amines, cycloaliphatic amines, and alkanolamines, said phosphonic acid having the formula



wherein R stands for $-CH_2OH$, $-CH_2-CH_2-OH$, $-CH=CH_2$ or $-CH_2-CH=CH_2$; said binders having a high degree of cross-linking density.

4,434,257
CEMENT COMPOSITION

Shizuo Narisawa; Yoshito Taira; Yuuji Yoshii, all of Ichihara, and Tomizou Kondou, Kyoto, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Sep. 21, 1982, Ser. No. 420,616
Claims priority, application Japan, Sep. 22, 1981, 56-150080
Int. Cl.[3] C04B 7/02, 7/35
U.S. Cl. 524—5 8 Claims

1. An improved cement composition which comprises a mixture of a cement composition and an emulsifier comprising an ethylene-vinyl acetate copolymer emulsion containing 1 to 10 parts by weight of a polyvinyl alcohol and 0.1 to 10 parts by weight of a higher fatty acid ester of a polyvalent alcohol having an HLB of 10 or less per 100 parts by weight of of the solid resin components of said emulsion, said ethylene-vinyl acetate copolymer emulsion comprising a copolymer having 5 to 40% by weight of an ethylene content, 20 to 95% by weight of a vinyl acetate content and 0 to 50% by weight of a fatty acid vinyl ester other than vinyl acetate, vinyl chloride and a (meth)acrylic acid ester.

4,434,258
ORGANIC ACID CONTAINING FILLED AND PLASTICIZED THERMOPLASTIC COMPOSITIONS BASED ON ETHYLENE INTERPOLYMERS

Frederick G. Schumacher, Wilmington, Del., and Walter Yllo, Carney's Point, N.J., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 15, 1982, Ser. No. 339,468
Int. Cl.[3] C08K 5/09, 5/11, 5/20
U.S. Cl. 524—13 18 Claims

1. A thermoplastic composition consisting essentially of

(a) from 0 to about 50% by weight of at least one copolymer of ethylene with at least one comonomer selected from the group consisting of vinyl esters of saturated carboxylic acids wherein the acid moiety has up to 4 carbon atoms, unsaturated mono- and dicarboxylic acids of 3 to 5 carbon atoms, salts of said unsaturated acids, and esters of said unsaturated acids wherein the alcohol moiety has 1 to 8 carbon atoms, the ethylene content of said copolymer being from about 40 to 95% by weight, the comonomer content of said copolymer being from about 5 to about 60% by weight, and the melt index of said copolymer being from 0.1 to about 400, provided that when said copolymer of ethylene is an ethylene/vinyl ester or ethylene/unsaturated mono- or dicarboxylic acid ester copolymer said copolymer can contain up to about 15 percent by weight of carbon monoxide or sulfur dioxide; provided, that when the olefin polymer of paragraph (e) is absent, the amount of ethylene copolymer is at least about 5% by weight;

(b) from 0 to 20 percent by weight of at least one plasticizer selected from the group consisting of processing oils, epoxidized oils, polyesters, polyethers, and polyether esters;

(c) from about 40 to about 90% by weight of filler;

(d) from about 0.05 to about 5% by weight of at least one organic acid or acid derivative selected from the group consisting of saturated mono- and polycarboxylic acids having from 6 to 54 carbon atoms, unsaturated mono- and dicarboxylic acids having from 12 to 20 carbon atoms, alicyclic and aromatic carboxylic acids and mono-, di- and trivalent metal salts, esters and amides of said organic acids, provided that the amount of acid is at least equal to the amount at which concentration a step-wise increase occurs on a plot of tensile elongation at break expressed as a function of acid concentration;

(e) from 0 to about 55% by weight of olefin polymer selected from the group consisting of low density branched polyethylene, high density linear polyethylene, linear copolymers of ethylene and another olefin comonomer, polypropylene and copolymers of propylene and ethylene where

the ethylene content is up to 20% by weight provided, that when the ethylene copolymer of paragraph (a) is absent the amount of olefin polymer is at least about 5% by weight; and

(f) from 0 to about 30% by weight of tackifier.

4,434,259

BASE COATINGS FOR USE ON VACUUM METALLIZED PAPER

Samuel Gold, Watchung; Arthur A. Tracton, Somerville, and Josephine M. Rosenski, North Plainfield, all of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed Apr. 26, 1982, Ser. No. 371,897

Int. Cl.³ B05D *3/06;* **G02B** *17/00*

U.S. Cl. 524—31 **10 Claims**

1. A lacquer base coating for paper substrates to be vacuum metallized, which consists essentially of a volatile organic solvent containing about 10–30% by weight of a film-forming coating mixture of:

(a) about 90–98% by weight of a copolymer of 97.5–99% vinyl acetate and 1–2.5% acrylic acid or a copolymer of 94–97% vinyl acetate and 3–6% monoethyl maleate, with the copolymer percentages totaling 100% by weight; and

(b) about 2–10% by weight of nitrocellulose resin solids, said resin being soluble in said solvent and having a nitrogen content of about 12% by weight and a viscosity of from about 4–5 seconds in a 25% solution to about 3–4 seconds in a 20% solution of ethyl alcohol/toluene/ethyl acetate (25/55/20 parts by weight), when measured using the Falling Ball method;

said coated substrate characterized by a balanced combination of alkali removability, water-resistance, and block-resistance.

4,434,260

THERMOPLASTIC RESIN SHAPING WITH OLEFIN/MALEIMIDE COPOLYMER LUBRICANT

Heinz Beck, Duren; Werner Holtvoigt, Lohne-Riessel, and Ambar Mukerjee, Nideggen, all of Fed. Rep. of Germany, assignors to Akzona, Inc., Asheville, N.C.

Continuation of Ser. No. 229,428, Jan. 29, 1981, abandoned, which is a continuation of Ser. No. 48,412, Jun. 14, 1979, abandoned. This application Mar. 15, 1982, Ser. No. 357,952

Claims priority, application Fed. Rep. of Germany, Jun. 14, 1978, 2825962

Int. Cl.³ C08L *27/06, 39/00*

U.S. Cl. 524—104 **3 Claims**

1. In a process for shaping at least one thermoplastic synthetic resin, the improvement comprising shaping the resin in the presence of a lubricant-effective amount of an α-olefin/maleinimide copolymer having an average molecular weight determined by gel permeation chromatography from about 5,000 to about 60,000.

4,434,261

EXTRUDABLE SELF-SUPPORTING HOT MELT ADHESIVE SHEET

Edward G. Brugel, Wilmington, Del., and Walter Yllo, Carneys Point, N.J., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 6, 1982, Ser. No. 405,756

Int. Cl.³ C08K *5/01, 5/09, 5/11, 5/20*

U.S. Cl. 524—109 **16 Claims**

1. An extrudable self-supporting hot melt adhesive sheet which is nonadhesive at room temperature but is adhesive at about 150° F., is self-supporting at about 200°–350° F. and has a melt index of from about 10 to about 500, said sheet comprising (a) from about 10 to about 50% by weight of at least one copolymer of ethylene with at least one comonomer selected from the group consisting of vinyl esters of saturated carboxylic acids wherein the acid moiety has up to 4 carbon atoms, unsaturated mono- and dicarboxylic acids of 3 to 5 carbon atoms, salts of said unsaturated acids, and esters of said unsaturated acids wherein the alcohol moiety has 1 to 8 carbon atoms, the ethylene content of said copolymer being from about 40 to about 95% by weight, the comonomer content of said copolymer being from about 5 to about 60% by weight, and the melt index of said copolymer or combination of copolymers being such that would result in a melt index of from about 10 to about 500 for the fully compounded adhesive, provided that when said copolymer of ethylene is an ethylene/vinyl ester or ethylene/unsaturated mono- or dicarboxylic acid ester copolymer said copolymer can contain up to about 15 percent by weight of carbon monoxide or sulfur dioxide; (b) from 2 to about 30 percent by weight of at least one plasticizer selected from the group consisting of processing oils, epoxidized oils, polyesters, polyethers, and polyether esters; (c) from about 20 to about 80% by weight of filler; (d) from 0 to about 10% by weight of at least one additive selected from the group consisting of organic acids, organic acid derivatives and surface active agents.

4,434,262

MELT PROCESSABLE BLEND OF A LOW MOLECULAR WEIGHT LIQUID CRYSTALLINE COMPOUND AND A POLYOLEFIN OR POLYESTER

Alan Buckley, Berkeley Heights; Anthony B. Conciatori, Chatham, and Gordon W. Calundann, N. Plainfield, all of N.J., assignors to Celanese Corporation, New York, N.Y.

Filed Sep. 1, 1982, Ser. No. 413,912

Int. Cl.³ C08K *5/29, 5/06*

U.S. Cl. 524—237 **29 Claims**

1. A melt processable blend comprising a major amount of a melt processable polymer which is not capable of forming an anisotropic melt phase apart from the blend selected from the group consisting of a polyolefin and a polyester and a minor amount of a liquid crystalline compound having a molecular weight of less than about 1000 selected from the group consisting of N,N'-bis(p-methoxybenzylidene)-alpha, alpha'-bi-p-toluidine, p-methoxycinnamic acid, N,N'-bis(4-octyloxybenzylidene)-p-phenylenediamine, and mixtures thereof which is capable of forming an anisotropic melt phase apart from the blend at the melt processing temperature of the blend.

4,434,263

HYDROLYTIC STABILITY IMPROVING ADDITIVE

Jennings P. Blackwell, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 20, 1982, Ser. No. 400,186

Int. Cl.³ C08K *3/40, 5/09;* **C08L** *81/00, 81/04*

U.S. Cl. 524—322 **50 Claims**

1. A composition comprising (a) poly(arylene sulfide), (b) glass and (c) alkyl carboxylic acid represented by the formula R—COOH wherein R is an alkyl radical and wherein R has at least 5 carbon atoms.

4,434,264

HIGH CLARITY PROPYLENE POLYMER COMPOSITIONS OF IMPROVED IMPACT STRENGTH

Harold K. Ficker, Wayne, N.J., assignor to El Paso Polyolefins Company, Paramus, N.J.

Filed Mar. 22, 1983, Ser. No. 477,703

Int. Cl.³ C08K *5/09;* **C08L** *23/12*

U.S. Cl. 524—323 **9 Claims**

1. A propylene polymer composition comprising

(a) from about 80 to about 95 wt % of a random copolymer of propylene and ethylene containing from about 1 to about 6 wt % polymerized ethylene, and

(b) from about 5 to about 20 wt % of a linear low density polyethylene copolymer of ethylene and at least one C_4–C_{18} alpha olefin comonomer, said copolymer having a density in the range from about 0.910 to about 0.935 gm/cc.

4,434,265

METACYCLOPHANE, SYNTHESIS THEREOF, AND COMPOSITIONS STABILIZED THEREBY

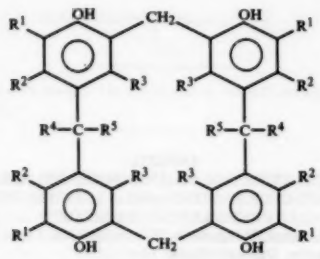
Dwight W. Chasar, Northfield, Ohio, assignor to The B.F. Goodrich Company, Akron, Ohio

Filed Jun. 15, 1983, Ser. No. 504,755

Int. Cl.³ C07C 39/12, 39/24; C08K 5/13

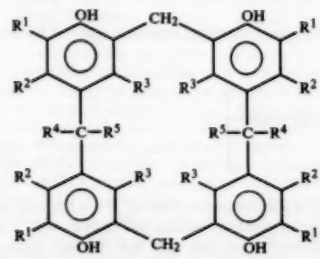
U.S. Cl. 524—339 11 Claims

1. The compound metacyclophane represented by the structure



wherein, R^1, R^2, R^3, R^4 and R^5 may each be the same or different and represent halogen; alkyl having from 1 to about 18 carbon atoms; alkoxy having from 1 to about 18 carbon atoms; and, hydrogen; except that R^1 cannot be hydrogen.

6. A composition of matter comprising an organic material subject to degradative attack by oxygen, and an effective amount, sufficient to counter said attack, of a solid reaction product recovered from reacting a 2-2'-disubstituted-bisphenol with paraformaldehyde at a temperature in the range from about 120° C. to about 200° C., at a pressure in the range from about 1 to about 8 atmospheres, in the presence of a mutual sovent for said bisphenol and formaldehyde said compound, metacyclophane, represented by the structure



wherein, R^1 R^2, R^3, R^4 and R^5 may each be the same or different and represent halogen; alkyl having from 1 to about 18 carbon atoms; alkoxy having from 1 to about 18 carbon atoms; and hydrogen; except that R'cannot be hydrogen.

4,434,266

METHOD FOR RUBBER TREATMENT AND THE RUBBER THUS TREATED

Chester D. Trivette, Jr., Akron, Ohio, assignor to Monsanto Company, St. Louis, Mo.

Filed Sep. 23, 1982, Ser. No. 424,733

Int. Cl.³ C08L 7/00, 9/00, 13/00

U.S. Cl. 524—425 25 Claims

1. The method of improving the properties of diene rubber comprising treating diene rubber by mastication with from 0.1 to 20 parts by weight per 100 parts diene rubber by weight of (B) a maleic acid half ester which is the product of the reaction of one mole of a mono- or poly-hydric alcohol of the formula $R(OH)_n$ with n moles or less of maleic acid or anhydride, where R is alkyl of 1–20 carbon atoms, cycloalkyl of 3–20 carbon atoms, aryl of 6–20 carbon atoms or aralkyl or alkaryl of 7–20 carbon atoms, optionally substituted with one or more non-reactive substituents selected from halogen, nitro and alkoxy or carboxy of 1–5 carbon atoms, and n is an integer of from 1–4 at an appropriate temperature above 130° C. for a time of from 0.1 to 20 minutes.

4,434,267

ORGANIC PIGMENTS

William W. Maslanka, London-Britain Township, Chester County, Pa., and Gavin G. Spence, New Castle County, Del., assignors to Hercules Incorporated, Wilmington, Del.

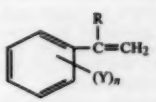
Division of Ser. No. 159,744, Jun. 16, 1980, Pat. No. 4,349,641, which is a division of Ser. No. 909,606, May 25, 1978, Pat. No. 4,235,982, which is a continuation-in-part of Ser. No. 803,330, Jun. 3, 1977, abandoned. This application Mar. 31, 1982, Ser. No. 364,162

Int. Cl.³ C08L 33/26, 39/08

U.S. Cl. 524—458 6 Claims

1. Water-insoluble graft copolymer particles consisting essentially of the free radical catalyzed graft copolmerization product of (1) at least one ethylenically unsaturated monomer and (2) a water-soluble cationic prepolymer having an RSV of about 0.1 to about 2.5 (1 M NaCl, 1%, 25° C.), the prepolymer moiety of the graft copolymer particles being present on the surface of the particles,

said monomer (1) being selected from the group consisting of methyl alpha-chloroacrylate, ethyl alpha-chloroacrylate, methyl methacrylate, isopropyl methacrylate, phenyl methacrylate, vinyl chloride, acrylonitrile, methacrylonitrile, and monomers having the formula



wherein R is hydrogen or methyl, Y is methyl or chlorine, and n is 0, 1, 2, or 3, and said prepolymer (2) being the addition polymerization product of

(i) about 5 mole percent to 100 mole percent of a cationic monomer selected from the group consisting of 2-vinylpyridinium chloride and 2-vinylpyridinium bromide, and

(ii) from about 95 mole percent to 0 mole percent of at least one monoethylenically unsaturated amide monomer,

the amount of prepolymer (2) employed in preparing the graft copolymer particles being from about 1 part to about 25 parts by weight for each 100 parts by weight of monomer (1) employed, said prepolymer moiety of the particles having chemically bonded thereto a cellulose reactive group, said cellulose reactive group being introduced by means of an epihalohydrin.

4,434,268

MANUFACTURE OF POLYMER DISPERSIONS

Andrew Doroszkowsky, Marlow, and Victor J. Pavey, Horsham, both of England, assignors to Imperial Chemical Industries PLC, London, England

Filed Mar. 8, 1982, Ser. No. 355,618

Claims priority, application United Kingdom, Mar. 19, 1981, 8108706

Int. Cl.³ C08L 27/14

U.S. Cl. 524—520 9 Claims

1. A water-borne coating composition which comprises a stable dispersion, in an aqueous medium consisting of a mixture of (i) water and (ii) an organic liquid which is dilutable with water to an unlimited extent without the occurrence of any phase separation, of a halogen-containing addition polymer

which is insoluble in the said aqueous medium, the dispersion having been made by dispersing pre-formed particles of the polymer in powder form, of number-average size in the range 0.1–10 microns, in the aqueous medium in the presence of a polymeric dispersant, the dispersant comprising at least one compound which contains in the molecule a hydrophobic polymer chain and groups which are strongly dissociated in the aqueous medium into ionic components, the strongly ionised groups being present in such a proportion as to provide a charge density of from 0.05 to 6.0 milliequivalents per gram of the total dispersant.

4,434,269

CATIONIC SIZING AGENT FOR PAPER AND A PROCESS FOR THE PREPARATION THEREOF

Joachim Probst, Cologne; Günter Kolb, Leverkusen; Peter Mummenhoff, Cologne, and Heinz Bäumgen, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 2, 1982, Ser. No. 344,991

Claims priority, application Fed. Rep. of Germany, Feb. 5, 1981, 3103917

Int. Cl.³ C08L *79/00*

U.S. Cl. 524—538 **6 Claims**

1. Cationic sizing agents for paper in the form of an aqueous colloid-disperse solution having average particle diameters of from 15 to below 50 nm, said agent being prepared by dissolving a water-soluble cationic, chemically uniformly composed terpolymer compound of:

(a) from 7 to 40% by weight of N,N-dimethylaminoethyl acrylate and/or methacrylate,

(b) from 45 to 80% by weight of styrene, and

(c) from 4 to 40% by weight of acrylonitrile

in an aqueous medium, the total of components (a) to (c) always amounting to 100% by weight and at least 10% of the N,N-dimethylamino groups of the terpolymer being quaternised and the rest being protonated, and emulsifying in the presence of from 10 to 70% by weight, based on the following monomer mixture, of this emulsifier,

(d) acrylonitrile or methacrylonitrile, in quantities of from 5 to 95% by weight, with

(e) C_1–C_{12}-alkyl esters of acrylic acid and/or of methacrylic acid in quantities of from 5 to 95% by weight,

the total of components (d) and (e) amounting to 100% by weight, and subjecting the emulsion thus obtained to a radically initiated emulsion polymerisation process at temperatures of from 20° to 150° C.

4,434,270

ETHYLENE/PROPYLENE/VINYL ALKYL KETONE POLYMERS

Carl Serres, Naperville, and John G. Schaffhausen, Aurora, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Dec. 6, 1982, Ser. No. 447,447

Int. Cl.³ C10M *3/12;* **C08F** *210/06, 216.30*

U.S. Cl. 524—570 **16 Claims**

1. An amorphous, oil soluble random ethylene/propylene/-vinyl alkyl ketone polymer having a mol ratio of ethylene to propylene from about 35:65 to 60:40 with up to 15 parts by weight vinyl alkyl ketone per 100 parts by weight ethylene/-propylene and wherein said polymer has an inherent viscosity of from about 0.1 to 2".

4,434,271

GLASS FILLED POLY(P-METHYLSTYRENE)

Frank J. Feeney, East Windsor, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 230,190, Feb. 2, 1981, abandoned. This application Aug. 13, 1982, Ser. No. 407,986

Int. Cl.³ C08K *7/14, 3/40*

U.S. Cl. 524—575 **2 Claims**

1. A heat stabilized homogeneous thermoplastic composition consisting essentially of p-methylstyrene homopolymer or copolymer containing at least 90 weight percent polymerized p-methylstyrene and 10 to 1 weight percent of a conjugated diene, in which said p-methyl styrene comprises mixtures of methyl styrenes containing at least 90 weight percent p-methylstyrene, less than 0.1 weight percent o-methylstyrene and the balance m-methylstyrene; and between about 5 percent and about 50 percent, based on the total weight of the composition, of a reinforcing filler which predominantly comprises glass fibers.

4,434,272

WATER-CURABLE, SILANE MODIFIED ALKYL ACRYLATE COPOLYMERS AND A PROCESS FOR THE PREPARATION THEREOF

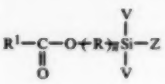
Michael J. Keogh, Bridgewater, N.J., assignor to Union Carbide Corporation, Danbury, Conn.

Continuation-in-part of Ser. No. 192,319, Sep. 30, 1980, Pat. No. 4,328,323, which is a continuation-in-part of Ser. No. 70,785, Aug. 29, 1979, Pat. No. 4,291,136, which is a continuation-in-part of Ser. No. 892,153, Mar. 31, 1978, abandoned. This application Feb. 22, 1982, Ser. No. 351,212

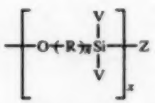
Int. Cl.³ C08L *25/14, 27/22, 33/08, 33/10*

U.S. Cl. 525—100 **28 Claims**

1. A composition of matter comprising a silane of the formula:



or a polysiloxane containing repeating units of the formula:



wherein R^1 is a hydrocarbon radical, R is a hydrocarbon radical or an oxy substituted hydrocarbon radical, each V is hydrogen, a hydrocarbon radical or a hydrolyzable group, Z is a hydrolyzable group, n is an integer having a value of 1 to 18 and x is an integer having a value of at least 2; a copolymer of an alkyl acrylate and a monomer having the formula:

wherein X is hydrogen or chlorine, Y is chlorine, a phenyl radical or cyano; and an organo titanate.

13. A water-curable, silane modified copolymer of an alkyl acrylate and a monomer of the formula:

wherein X is hydrogen or chlorine and Y is chlorine, a phenyl radical or cyano, obtained from a composition defined in claim 1.

4,434,273
PERFLUOROKETOVINYL ETHERS AND COPOLYMERS THEREFROM

Ronald E. Uschold, West Chester, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 279,024, Jun. 30, 1981, Pat. No. 4,385,187. This application Sep. 29, 1982, Ser. No. 427,471
Int. Cl.[3] C08F *8/04*
U.S. Cl. 525—326.2 5 Claims

1. Copolymer of the perfluoroketovinyl ether of the formula

$$CF_2{=}CFO(CF_2\underset{\displaystyle CF_3}{\underset{|}{C}}FO)_nCF_2COCF_3$$

wherein n is an integer 1 to 4 and one or more fluorinated vinyl monomers.

4,434,274
VULCANIZABLE COMPOSITIONS OF HALOGEN AND CARBOXYL CONTAINING ACRYLATE ELASTOMERS, 2,5-DIMERCAPTO-1,3,4-THIADIAZOLE, A GROUP IVA METAL OXIDE OR SALT AND A TETRAALKYL THIURAM SULFIDE

Dane E. Jablonski, Brunswick, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Apr. 12, 1982, Ser. No. 367,633
Int. Cl.[3] C08F *8/34, 220/22*
U.S. Cl. 525—349 3 Claims

1. A composition comprising (1) an acrylate rubber containing (a) from about 65 percent to about 98 percent by weight of an acrylate of the formula

$$CH_2{=}CH{-}\overset{\displaystyle O}{\overset{\|}{C}}{-}O{-}R$$

wherein R is selected from the group consisting of an alkyl radical containing 1 to 10 carbon atoms and an alkoxyalkyl radical containing 2 to about 8 carbon atoms, (b) from about 0.2 percent to about 15 percent by weight of a halogen-containing monomer selected from the group consisting of halogen-containing vinylidene hydrocarbons and halogen-containing vinyl monomers having the halogen group at least two carbon atoms removed from an oxygen atom, (c) from about 0.2 percent to about 10 percent by weight of an unsaturated carboxyl-containing monomer, and (d) up to about 10 percent by weight of a copolymerizable monomer containing a terminal vinylidene group, and (2) a curative consisting essentially of about 0.4 to about 2.0 weight parts of 2,5-dimercapto-1,3,4-thiadiazole, about 0.5 to about 1.5 weight part of a fatty acid salt of lead or tin and about 1.5 to 3.5 weight parts of tetralkyl thiuram disulfide wherein the alkyl groups contain 1 to 6 carbon atoms, all weights based on 100 weight parts of acrylate rubber.

4,434,275
POLYEPICHLOROHYDRIN ELASTOMERS HAVING IMPROVED RESISTANCE TO SOUR GASOLINE

James E. Longfield, Basking Ridge, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Sep. 23, 1982, Ser. No. 421,949
Int. Cl.[3] C08L *71/02*
U.S. Cl. 525—403 11 Claims

1. A vulcanizable mixture comprising a polyepichlorohydrin elastomer and a sour gasoline degradation reducing effective amount of a polythiodiethanol elastomer represented by the formula:

$$H{-}OG{-}_n OH$$

wherein —OG— comprises a copolymer of randomly alternating structural units selected from: (A) Structural units $—OC_2H_4SC_2H_4—$ (II) and —OR— (III), wherein R represents one or more radicals remaining on removal of two hydroxyl groups from (a) saturated aliphatic linear, branched chain or cyclic diols, or (b) aliphatic linear, branched chain or cyclic diols containing external unsaturation having an allylic hydrogen atom; and (B) structural units [II], [III] and —OR′—, wherein R′ represents the radical remaining on removal of two hydroxyl groups from a diphenolic compound; said copolymer comprising structural units selected from (A) and (B) being characterized in that (1) n is an integer sufficient to provide in said copolymer a molecular weight of at least about 2000, (2) the molar ratio of structural units $—OC_2H_4SC_2H_4—$ to —OR—, when the polymer comprises structural units (A), or the molar ratio of structural units $—OC_2H_4SC_2H_4—$ to the total of —OR— and —OR′—, when the polymer comprises structural units (B), being not less than 1:1, and (3) the copolymer contains from about 1 to 10 mole percent of said diol (b), based upon the total of all structural units $—OC_2H_4SC_2H_4—$, —OR— and —OR′— present in the copolymer.

4,434,276
PROCESS FOR THE CONDENSATION OF POLY(ALKYLENE TEREPHTHALATES)

Gernot Horlbeck, and Horst Heuer, both of Haltern, Fed. Rep. of Germany, assignors to Chemische Werke Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Mar. 31, 1983, Ser. No. 481,111
Claims priority, application Fed. Rep. of Germany, Mar. 31, 1982, 3211899
Int. Cl.[3] C08G *63/26*
U.S. Cl. 525—437 13 Claims

1. A process for further condensing a linear poly(alkylene terephthalate) having a viscosity number of at least 50 cm^3/g in the solid phase at an elevated temperature, comprising condensing the poly(alkylene terephthalate) in an inert gas stream at a temperature 25°-65° C. below the melting point of the poly(alkylene terephthalate) and in the presence of 0.5-5% by weight, based on the amount of poly(alkylene terephthalate), of a phosphorous acid ester of the formula $P(OR_1)(OR_2)(OR_3)$ wherein each of R_1, R_2 and R_3 is independently C_{1-12} alkyl, C_{6-10}-aryl, C_{5-12}-cycloalkyl, or C_{6-10}-aryl or C_{5-12}-cycloalkyl each substituted by C_{1-12}-alkyl, cyclohexyl, phenyl or phenyl-C_{1-12}-alkyl, wherein the amount of inert gas passed through the reactor per hour, measured under normal conditions, is 0.5-1.5 times the gross reactor volume.

13. A poly(alkylene terephthalate) produced by the process of claim 1.

4,434,277
POLYOL FOR A POLYURETHANE PREPARED BY REACTING AN EPOXIDE WITH THE REACTION PRODUCT OF A PHENOL, AN AROMATIC AMINE, AN ALDEHYDE AND A DIALKANOLAMINE

Shigeyuki Kozawa; Noboru Hasegawa, and Hiroshi Kawahara, all of Yokohama, Japan, assignors to Asahi Glass Company, Ltd., Tokyo, Japan

Filed Dec. 30, 1981, Ser. No. 335,835
Int. Cl.[3] C08G *65/40*
U.S. Cl. 525—507 13 Claims

1. A polyol for the synthesis of a polyurethane prepared by reacting an epoxide with the reaction product obtained by reacting (a) a phenol compound of the formula A—OH, wherein A represents an aromatic ring having at least two reactive sites; (b) an aromatic amine of the formula $B—NH_2$, wherein B represents an aromatic ring having at least two reactive sites; (c) an aldehyde and (d) a dialkanolamine.

4,434,278

PHOSPHATE ESTERS OF ACRYLATED EPOXIDES

Ronald J. Skiscim, Crestwood, Ky., assignor to Celanese Corporation, New York, N.Y.

Filed Sep. 27, 1982, Ser. No. 423,502
Int. Cl.³ C08L 63/00
U.S. Cl. 525—531 16 Claims

1. A radiation curable composition prepared by the process of reacting 1 mole of a polyepoxide having n epoxide groups per molecule, wherein n has a value of 2–4, with about n−1 moles of acrylic acid or methacrylic acid, followed by reacting the resulting product with about 0.5 to 1 mole of phosphoric when n is 2 and 1 mole of phosphoric acid when n is 3 or 4 in the presence of at least about 1.0 equivalent of a hydroxyl group-containing material per mole of phosphoric acid.

4,434,279

HIGH SWELL RESINS

George S. Achorn, West Chester, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Aug. 2, 1982, Ser. No. 403,601
Int. Cl.³ C08F 2/38
U.S. Cl. 526—66 2 Claims

1. In a process comprising (a) polymerizing ethylene in slurry of inert hydrocarbon diluent in the presence of a Ziegler catalyst, having an efficiency of greater than 70,000 grams polyethylene per gram of transition metal in the catalyst, and hydrogen as a molecular weight regulator; (b) venting of ethylene and hydrogen; (c) filtering the resulting polyethylene with active catalyst residues from diluent; and (d) drying said polymer to eliminate traces of diluent; the improvement comprising polymerizing additional ethylene in the presence of filtered polymer from step (c), above, and containing still active catalyst residues but in the absence of hydrogen and then drying the polymer; whereby a polyethylene having an intimate mixture of higher molecular weight polyethylene therein and having a resulting increase in percent swell is formed.

4,434,280

POLYMERIZATION PROCESS USING SURFACE HEAT TREATED SILICA-CONTAINING CATALYST BASE

Max P. McDaniel, and M. Bruce Welch, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 303,302, Sep. 17, 1981, Pat. No. 4,378,306.
This application Sep. 29, 1982, Ser. No. 427,255
Int. Cl.³ C08F 4/02, 4/24
U.S. Cl. 526—106 18 Claims

1. A polymerization process comprising

contacting at least one mono-1-olefin having 2 to 8 carbon atoms per molecule in a reaction zone under polymerization conditions with a catalyst produced by a process comprising:

subjecting a particulate silica-containing material to a heat treatment for a time and at a temperature sufficient to sinter the outside of the particles of said silica-containing material without significantly affecting the inside of the particles, said silica-containing-material either having a chromium compound contained therein during said heat treatment or having a chromium compound added thereto, and activating by a process comprising heating said silica-containing material also containing said chromium compound in an oxygen-containing ambient; and

recovering a polymer.

4,434,281

POLYMERIZING OLEFINS WITH A NOVEL CATALYST

Harold E. Swift, Gibsonia, and Richard W. Lunden, Pittsburgh, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Division of Ser. No. 227,691, Jan. 23, 1981, Pat. No. 4,376,061.
This application Oct. 19, 1982, Ser. No. 434,702
Int. Cl.³ C08F 4/02, 10/00
U.S. Cl. 526—119 39 Claims

1. A process for the polymerization of an olefin which comprises contacting said olefin at elevated temperatures and elevated pressures with an activator and a solid, particulate, catalyst complex prepared by a process comprising reducing $TiCl_4$, contacting the resultant reduced solid with a complexing agent to obtain a treated solid and contacting the treated solid with $TiCl_4$ in the presence of silica which has been treated with an alkylaluminum halide.

4,434,282

PROCESS FOR POLYMERIZING OLEFINS

Calvin P. Esneault, Baton Rouge, La., assignor to The Dow Chemical Company, Midland, Mich.

Filed Oct. 4, 1982, Ser. No. 432,609
Int. Cl.³ C08F 4/02, 10/00
U.S. Cl. 526—125 17 Claims

1. A process for the polymerization of an α-olefin or mixtures thereof under conditions characteristic of Ziegler polymerization wherein the polymerization is conducted in the presence of

(I) a supported catalyst which is the solid, hydrocarbon insoluble reaction product formed by reacting in an inert diluent

(1) the reaction product of

(a) a magnesium component or mixture of such components represented by the formula $MgR'_2 \cdot xMeR'_{x'}$, wherein each R is independently a hydrocarbyl group having from 1 to about 20 carbon atoms, each R′ is independently a hydrocarbyl or a hydrocarbyloxy group having from 1 to about 20 carbon atoms, Me is aluminum, zinc or boron, x has a value of from zero to about 10 and x′ has a value equal to the valence of Me; with

(b) a sufficient amount of at least one diol having at least six carbon atoms wherein there are from three to about eight carbon atoms between the hydroxyl groups of said diol(s); and wherein the mole ratio of component (1-a) to (1-b) is about 1:1; with

(2) a halide-containing transition metal compound or mixture thereof represented by the formula TmY_nX_{z-n} wherein Tm is a metal selected from groups IV-B, V-B and VI-B of the Periodic Table of Elements, Y is oxygen or OR″, each X is a halogen, each R″ is independently a hydrocarbyl group having from 1 to about 20 carbon atoms, z has a value equal to the valence of said transition metal, n has a value of from zero to 6 with the value of z−n being from at least 1 up to a value equal to the valence of the transition metal; said halide-containing transition metal being present in a quantity so as to convert substantially all of the substituent groups attached to a magnesium atom in component (1) to a halide group; and

(II) an activating agent therefor wherein components (I) and (II) are

(a) added separately to one or more polymerization reactor(s) or zone(s);

(b) mixed together just prior to addition to one or more polymerization reactor(s) or zone(s); or

(c) reacted together before addition to one or more polymerization reactor(s) or zone(s).

4,434,283

POLYSILOXANE MOLDING COMPOSITIONS

Hans Sattlegger, Odenthal; Karl Schnurrbusch, Leverkusen; Bruno Degen, Bergisch-Gladbach, and Theo Achtenberg, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 165,573, Jul. 2, 1980, abandoned. This application Feb. 8, 1982, Ser. No. 346,810

Claims priority, application Fed. Rep. of Germany, Jul. 21, 1979, 2929635

Int. Cl.³ C08G 77/04

U.S. Cl. 528—34 3 Claims

1. In a polysiloxane molding composition which in the presence of water crosslinks to an elastomer and which comprises

(A) an α,ω-dihydroxyorganopolysiloxane with a viscosity of about 500 to 2,000,000 cP,

(B) a crosslinking agent, and

(C) a reinforcing filler,

the improvement which comprises including therein in about 0.1 to 10% by weight a silicon compound containing at least 3 alkoxy groups and employing as the crosslinking agent an alkoxybenzamidosilane or an alkoxypropionamidosilane whereby the elastomer ultimately produced exhibits improved direct adhesion to various substances.

4,434,284

POLYURETHANE FORMULATION FOR LARGE SCALE CASTING

Thomas G. Rukavina, Lower Burrell, and Charles R. Coleman, Pittsburgh, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed May 10, 1982, Ser. No. 376,490

Int. Cl.³ C08G 18/24, 18/06

U.S. Cl. 528—58 7 Claims

1. In a method of reacting an isocyanate compound with a compound containing active hydrogen capable of reacting with the isocyanate in the presence of a catalyst to form a polyurethane, wherein the catalyst is dissolved in the active hydrogen compound at a sufficient temperature to maintain the compound in a liquid phase, which compound is then mixed into the isocyanate at a sufficient temperature to prevent the compound from freezing out of solution, the improvement which comprises mixing the isocyanate into the active hydrogen compound in the absence of the catalyst at a sufficient temperature to maintain a homogeneous single-phase reaction solution, cooling the solution to a minimum temperature above the temperature at which the active hydrogen compound freezes out of the solution, which temperature is below the normal freezing point of the catalyst, and finally adding the catalyst.

4,434,285

POLYPHENYLENE-TYPE POLYMERIC COMPOUND AND PROCESS FOR PRODUCTION THEREOF

Takuma Teshirogi, Yonezawa, Japan, assignor to Dainippon Ink and Chemicals, Inc., Tokyo, Japan

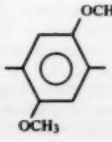
Filed Sep. 10, 1982, Ser. No. 416,480

Claims priority, application Japan, Sep. 14, 1981, 56-144026

Int. Cl.³ C08G 61/10, 61/12

U.S. Cl. 528—86 7 Claims

1. Poly(dimethoxyphenylene) composed of recurring structural units of the formula



4,434,286

CURABLE EPOXY RESIN CONTAINING COMPOSITIONS

Allison S. Burhans, Prineville, Oreg., and Orson K. Spurr, Jr., Bridgewater, N.J., assignors to Union Carbide Corporation, Danbury, Conn.

Continuation of Ser. No. 203,440, Nov. 3, 1980, abandoned. This application Nov. 10, 1982, Ser. No. 440,456

Int. Cl.³ C08G 59/24, 59/26, 59/62

U.S. Cl. 528—297 16 Claims

1. A curable composition comprising a cycloaliphatic epoxide, a polyether polyol having a molecular weight of from about 1000 to that molecular weight which does not form a two-phase system with the epoxide, and a hardener.

4,434,287

CEPHALOSPORIN DERIVATIVES

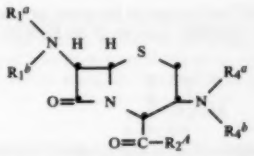
Robert B. Woodward, Cambridge, Mass., and Hans Bickel, Binningen, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 36,483, May 7, 1979, Pat. No. 4,319,027, which is a continuation of Ser. No. 913,429, Jun. 7, 1978, abandoned, which is a division of Ser. No. 671,193, Feb. 10, 1976, Pat. No. 4,110,533. This application Nov. 19, 1981, Ser. No. 323,147

Int. Cl.³ C07D 501/20; A61K 31/545

U.S. Cl. 544—16 9 Claims

1. A compound of the formula

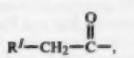


(III)

wherein R_1^a represents an acyl group of the formula

(A1)

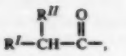
wherein R^1 represents hydrogen, cyclopentyl, cyclohexyl or cycloheptyl, or such cycloalkyl which is substituted in the 1-position by amino, protected amino, sulphoamino or sulphoamino in the form of an alkali metal salt, or R^1 represents phenyl, naphthyl or tetrahydronaphthyl, or phenyl, naphthyl or tetrahydronaphthyl substituted by hydroxyl, protected hydroxyl, and/or by halogen, or R^1 represents 4-isoxazolyl, or R^1 represents an amino group which is N-substituted by lower alkyl or halogen substituted lower alkyl, or R_1^a represents an acyl group of the formula



(A2)

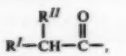
wherein R^1 represents lower alkyl, halogeno-lower alkyl, phenyloxy-lower alkyl, hydroxyphenyloxy-lower alkyl, protected hydroxy-phenyloxy-lower alkyl, halogeno-phenyloxy-lower alkyl, or lower alkyl substituted by amino and/or carboxyl, wherein amino is free or protected and carboxyl is free or protected, or R^1 represents lower alkenyl, phenyl, hydroxyphenyl, protected hydroxyphenyl, halogeno-phenyl, hydroxy-halogeno-phenyl, protected hydroxy-halogeno-phenyl, amino-lower alkyl-phenyl, protected amino-lower alkyl-phenyl, phenyloxyphenyl, or R^1 represents pyridyl, pyridinium, thienyl, furyl, imidazolyl or tetrazolyl, or these heterocyclic groups substituted by lower alkyl, amino, protected amino, aminomethyl or protected aminomethyl, or R^1 represents

lower alkoxy, phenyloxy, hydroxy-phenyloxy, protected hydroxyphenyloxy, halogeno-phenyloxy, lower alkylthio, lower alkenylthio, phenylthio, pyridylthio, 2-imidazolylthio, 1,2,4-triazol-3-ylthio, 1,3,4-triazol-2-ylthio, 1,2,4-thiadiazol-3-ylthio, 1,3,4-thiadiazol-2-ylthio, or 5-tetrazolylthio, and these heterocyclylthio groups, substituted by lower alkyl, or R^I represents halogeno, lower alkoxycarbonyl, cyano, carbamoyl, N-lower alkyl-carbamoyl, N-phenylcarbamoyl, lower alkanoyl, benzoyl, or azido, or $R_1{}^a$ represents an acyl group of the formula



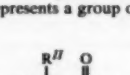
(A3)

wherein R^I represents lower alkyl, phenyl, hydroxyphenyl, protected hydroxyphenyl, halogeno-phenyl, hydroxy-halogenophenyl, protected hydroxy-halogeno-phenyl, furyl, thienyl, or isothiazolyl, and also represents 1,4-cyclohexadienyl, and R^{II} represents amino, protected amino, guanidinocarbonyl-amino, sulphoamino, sulphoamino in alkalimetal salt-form, azido, carboxyl, carboxyl in alkali-metal salt-form, protected carboxyl, cyano, sulpho, hydroxyl, protected hydroxyl, O-lower alkyl-phosphono, O,O'-di-lower alkylphosphono or halogeno, or $R_1{}^a$ represents a group of the formula



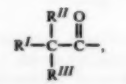
(A4)

wherein R^I and R^{II} each represent halogeno, or lower alkoxycarbonyl, or $R_1{}^a$ represents a group of the formula



(A5)

wherein R^I represents phenyl, hydroxyphenyl, protected hydroxyphenyl, hydroxy-halogeno-phenyl, protected hydroxy-halogeno-phenyl, furyl, thienyl, isothiazolyl or 1,4-cyclohexadienyl, and R^{II} represents aminomethyl or protected aminomethyl, or $R_1{}^a$ represents a group of the formula



(A6)

wherein each of the groups R^I, R^{II} and R^{III} represents lower alkyl, and $R_1{}^b$ represents hydrogen, or $R_1{}^a$ and $R_1{}^b$ together represent 1-oxo-3-aza-1,4-butylen, such group substituted in the 2-position by a group R^I as defined under formula (A3) and such group substituted in the 4-position by lower alkyl, $R_2{}^d$ represents a group which together with the carbonyl grouping —C(=O)— forms a protected esterified carboxyl group, and the group —N($R_4{}^a$) ($R_4{}^b$) denotes a secondary amino group, wherein one of the substituents $R_4{}^a$ and $R_4{}^b$ represents hydrogen and the other represents lower alkyl, lower alkoxy-lower alkyl, lower alkyl-thio lower alkyl, cyclohexyl-lower alkyl, phenyl-lower alkyl, thienyl-lower alkyl, cycloalkyl with 3 to 7 carbon atoms, or such cycloalkyl substituted by lower alkyl, lower alkoxy, lower alkylthio, cyclohexyl, phenyl, or furyl, or wherein —N($R_4{}^a$) ($R_4{}^b$) denotes a tertiary amino group, wherein each of the substituents $R_4{}^a$ and $R_4{}^b$, independent of each other is lower alkoxy-lower alkyl, lower alkylthio-lower alkyl, cyclohexyl-lower alkyl, thienyl-lower alkyl, cycloalkyl with 3 to 7 carbon atoms, or such cycloalkyl substituted by lower alkyl, lower alkoxy, lower alkylthio, cyclohexyl, phenyl, or furyl, or wherein $R_4{}^a$ denotes lower alkyl, and $R_4{}^b$ denotes lower alkoxy-lower alkyl, lower alkylthio-lower alkyl, cyclohexyl-lower alkyl, thienyl-lower alkyl, cycloalkyl with 3 to 7 carbon atoms, or such cycloalkyl substituted by lower alkyl, lower alkoxy, lower alkylthio, cyclohexyl, phenyl or furyl, or wherein $R_4{}^a$ denotes phenyl-lower alkyl and $R_4{}^b$ denotes lower alkoxy-lower alkyl, lower alkylthio-lower alkyl, cyclohexyl-lower alkyl, thienyl-lower alkyl, cycloalkyl with 3 to 7 carbon atoms, or such cycloalkyl substituted by lower alkyl, lower alkoxy, lower alkylthio, cyclohexyl, phenyl, or furyl or wherein —N($R_4{}^a$) ($R_4{}^b$) is 1-aziridinyl, [1-pyrrolidinyl, 1-piperidyl,] 1H-2,3,4,5,6,7-hexahydroazepinyl, [4-morpholinyl, 4-thio-morpholinyl,] or 1-piperazinyl, and in which the double bond can be in the 2,3-position or the 3,4-position or a mixture of a compound having the double bond in the 2,3-position and a compound having the double bond in the 3,4-position.

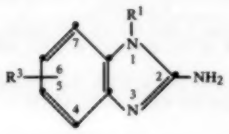
4,434,288

PREPARATION OF SUBSTITUTED 1-THIAZINYL OR 1-THIAZOLYL-2-AMINOBENZIMIDAZOLES

James H. Wikel, II, Greenwood, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

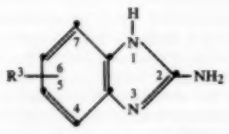
Filed Apr. 8, 1982, Ser. No. 366,883
Int. Cl.³ C07D *235/30*
U.S. Cl. 544—54 **8 Claims**

1. A process for preparing 1,5(6)-substituted-2-aminobenzimidazoles of the formula I



I

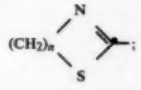
which comprises reacting a tautomeric benzimidazole of the formula II



II

with a second reactant of the formula $X(CH_2)_nNCS$ in the presence of an alkali metal hydroxide or carbonate, water, and a water-miscible nonhydroxylic solvent at a temperature from about 0° C. to about 75° C., wherein

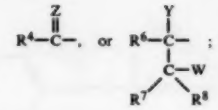
R^1 is



;

R^2 is C_1–C_5 alkyl, C_3–C_7 cycloalkyl, phenyl, furyl, or thienyl;

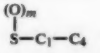
R^3 is at the 5- or 6-position and is hydrazinocarbonyl, carboxy, carboxamido, N-(C_1–C_4 alkyl)carboxamido, hydroxymethyl, cyano, nitro, C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 alkylthio, methylsulfonyl, phenylthio, phenylsulfinyl, phenoxy, trifluoromethyl, C_1–C_8 alkoxycarbonyl, allyloxycarbonyl, propargyloxycarbonyl, (C_3–C_7 cycloalkyl)oxycarbonyl, (C_3–C_7 cycloalkyl)methoxycarbonyl, 1-(C_3–C_7 cycloalkyl)ethoxycarbonyl, benzyloxycarbonyl, α-methylbenzyloxycarbonyl, phenoxycarbonyl, C_1–C_8 alkoxycarbonylmethyl, 1-(C_1–C_8 alkoxycarbonyl-)ethyl,



R^4 is hydrogen, C_1–C_7 alkyl, C_3–C_7 cycloalkyl, (C_3–C_7 cycloalkyl)methyl, 1-(C_3–C_7 cycloalkyl)ethyl, thienyl, benzyl, phenyl, or mono-substituted phenyl wherein said substituent is selected from the group consisting of C_1–C_4 alkyl, C_1–C_4 alkoxy, chloro, bromo, iodo, nitro, and trifluoromethyl;

R^6 is hydrogen, C_1–C_7 alkyl, C_3–C_7 cycloalkyl, (C_3–C_7 cycloalkyl)methyl, 1-(C_3–C_7 cycloalkyl)ethyl, phenyl, or mono-substituted phenyl, wherein said phenyl substituent is selected from the group consisting of C_1–C_4 alkyl, C_1–C_4 alkoxy, chloro, bromo, iodo, nitro, and trifluoromethyl;

R^7 and R^8 independently are hydrogen, halo, cyano, hydroxymethyl, nitro,



alkyl, CH_2R^9, COR^9, phenyl or mono-substituted phenyl, wherein said phenyl substituent is selected from the group consisting of C_1–C_4 alkyl, C_1–C_4 alkoxy, chloro, bromo, iodo, nitro, and trifluoromethyl;

R^9 is hydroxy, C_1–C_4 alkoxy, C_3–C_6 cycloalkyl-C_1–C_4 alkoxy, or (O–C_1–C_4 alkyl)$_p$$NR^{10}R^{11}$;

R^{10} and R^{11} independently are hydrogen or C_1–C_4 alkyl;

Z is oxygen, C_1–C_4 alkoxyimino, or C_1–C_7 alkylidene;

X is chloro or bromo;

Y is hydrogen and W is hydroxy, or together Y and W form a bond;

m is 0, 1, or 2;

n is 2 or 3; and

p is 0 or 1.

4,434,289

PROCESS FOR THE PREPARATION OF 2-TRIMETHYLSILYLOXY-ETHYLAMINES

Kurt Findeisen, Odenthal, and Heinz Ziemann, Leichlingen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

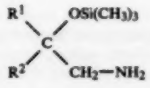
Filed Jul. 8, 1982, Ser. No. 396,515

Claims priority, application Fed. Rep. of Germany, Jul. 24, 1981, 3129272

Int. Cl.³ C07F *7/10*

U.S. Cl. 546—14 **16 Claims**

1. A trimethylsilyloxy-ethylamine of the formula



wherein R^1 and R^2 are identical or different and denote hydrogen, alkyl with 1 to 18 carbon atoms, alkenyl with 2 to 12 carbon atoms, cycloalkyl or cycloalkenyl with in each case 3 to 10 carbon atoms or aryl with up to 14 carbon atoms, or together, by linking via at least one methylene group which link can contain an amino or oxo group, represent a 5-membered or 6-membered ring, R^2 being other than hydrogen if R^1 is hydrogen.

4,434,290

PYRIDO (4,3-B) CARBAZOLES SUBSTITUTED IN THE 1 POSITION BY A POLYAMINE CHAIN

Emile Bisagni, Orsay; Claire Ducrocq, Les Ulis-Orsay; Christian Rivalle, Villebon; Pierre Tambourin, Les Ulis-Orsay; Francoise Wendling, Paris; Alain Civier, Montlhery; Luc Montagnier, Le Plessis-Robinson; Jean-Claude Chermann, Elancourt; Jacqueline Gruest, L'Hay-les-Roses, and Rosette Lidereau, Colombes, all of France, assignors to Agence Nationale de Valorisation de la Recherche, Neuilly sur Seine, France

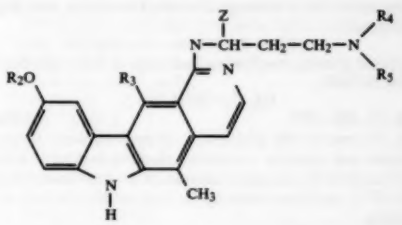
Continuation of Ser. No. 75,756, Sep. 14, 1979, abandoned. This application May 1, 1981, Ser. No. 259,553

Claims priority, application France, Sep. 21, 1978, 78 27137

Int. Cl.³ C07D *471/04*

U.S. Cl. 546—70 **3 Claims**

1. A compound of the formula



wherein Z, R_2 and R_3 are selected from the group consisting of hydrogen and methyl, R_4 and R_5 are selected from the group consisting of hydrogen, methyl and ethyl, and their non-toxic, pharmaceutically acceptable acid addition salts.

4,434,291

MULTIFUNCTIONAL ADDITIVES FOR LUBRICANTS

Edilberto Colombo, Aicurzio, Italy, assignor to Agip Petroli S.p.A., Rome, Italy

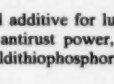
Filed Jun. 4, 1982, Ser. No. 385,081

Claims priority, application Italy, Jun. 26, 1981, 22583 A/81

Int. Cl.³ C07F *9/65*

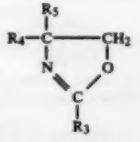
U.S. Cl. 548—116 **6 Claims**

1. A multifunctional additive for lubricants with antiwear, antioxidant and high antirust power, which is prepared by reacting a O,O'-dialkyldithiophosphoric acid of the formula



where R_1 and R_2, which can be the same or different, are alkyl radicals containing from 3 to 20 carbon atoms, with a nitrogenated derivative chosen from:

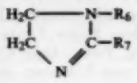
(a) a substituted 2-oxazoline of the formula



in which

R_3 is an alkyl group containing from 1 to 30 carbon atoms, and R_4 and R_5, which can be equal or different, can be hydrogen or an alkyl group containing from 1 to 5 carbon atoms, and

(b) a substituted imidazoline of the formula



where

R_6 and R_7, which can be the same or different and are alkyl groups containing from 1 to 30 carbon atoms.

4,434,292

PROCESS FOR THE PREPARATION OF PYRAZOLE

Ulrich Heinemann; Rudolf Thomas, both of Wuppertal; Reinhard Lantzsch, Leverkusen; Klaus Ditgens, and Erhard Weber, both of Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

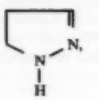
Filed Sep. 8, 1981, Ser. No. 300,329

Claims priority, application Fed. Rep. of Germany, Sep. 19, 1980, 3035395

Int. Cl.³ C07D *231/12*

U.S. Cl. 548—373 **5 Claims**

1. Process for the preparation of pyrazole from hydrazine hydrate and acrolein comprising reacting hydrazine hydrate with acrolein in an organic medium at a temperature between 20°–60° C. and then oxidizing the 2-pyrazoline formed, of the formula



(I)

either directly or after first being isolated, with chlorine or an alkali metal hypochlorite in the presence of water or an aqueous-organic medium at a temperature between 0° and 30° C.

4,434,293

TETRAHYDROTHIOPHENE DERIVATIVES AND METHODS OF PREPARATION

Robert A. Sanchez, La Jolla, Calif., assignor to American Hoechst Corporation, Somerville, N.J.

Continuation-in-part of Ser. No. 116,094, Jan. 28, 1980, abandoned. This application Aug. 5, 1981, Ser. No. 290,390

Int. Cl.³ C07D *333/32, 333/34, 495/12*

U.S. Cl. 549—17 **7 Claims**

1. Octahydrodithieno (3,4-b:3',4'-e)1,4-dithin.

2. A process for preparing cis-3-hydroxy-4-mercaptotetrahydrothiophene which comprises:

(a) treating 1,4-dithiothreitol with a strong inorganic acid; and

(b) recovering cis-3-hydroxy-4-mercaptotetrahydrothiophene from the reaction mixture of step (a).

4,434,294

PREPARATION OF α-CYANO-PHENOXY-BENZYL ESTERS

Jacques Martel, Bondy; Jean Tessier, Vincennes, and Andre Teche, Paris, all of France, assignors to Roussel Uclaf, Paris, France

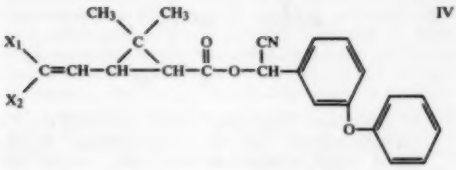
Division of Ser. No. 212,566, Dec. 3, 1980, Pat. No. 4,312,817. This application Oct. 1, 1981, Ser. No. 307,690

Claims priority, application France, Dec. 17, 1979, 79 30843

Int. Cl.³ C07D *333/32, 307/20*; C07C *121/75*

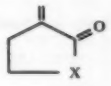
U.S. Cl. 549—65 **5 Claims**

1. A process for the preparation of all stereoisomeric forms of a compound of the formula

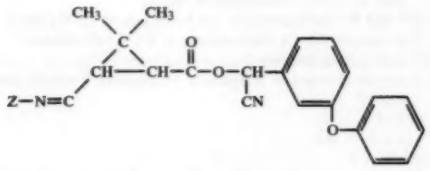


IV

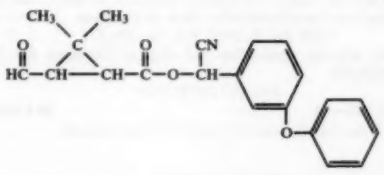
wherein X_1 and X_2 are individually selected from the group consisting of alkyl of 1 to 4 carbon atoms, fluorine, chlorine and bromine or taken together with the carbon atom to which they are attached form a carbon homocycle of 3 to 7 carbon atoms or a heterocycle of the formula



and X is selected from the group consisting of oxygen and sulfur with the acid moiety having the racemic or optically active, cis or trans structure and the alcohol moiety having the (R) or (S) configuration comprising reacting an ester of 3-formylcyclo-propane-1-carboxylic acids in their various isomeric forms and mixtures thereof of the formula

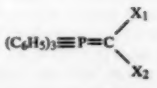


wherein Z is an organic residue of a primary amine of the formula $Z—NH_2$ and the acid moiety may have the cis or trans configuration with the alcohol moiety having the (S) or the (R) configuration with an acid hydrolysis agent to obtain a compound of the formula

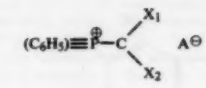


V

with the same configuration of the starting ester, reacting the latter in an organic solvent with a phosphorane of the formula



resulting from the reaction of a strong base with a compound of the formula



wherein X_1 and X_2 have the above definition and $A\ominus$ is a mineral acid anion resulting from the reaction of triphenylphosphine and a haloform with a strong base in an organic solvent Y to obtain the compound of formula IV with the same configuration of the starting ester.

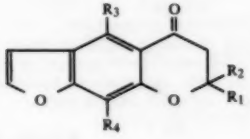
4,434,295

ANTI-ATHEROSCLEROTIC 6,7-DIHYDRO-7,7-DISUBSTITUTED-KHELLIN ANALOGS

Ronald B. Gammill, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed May 17, 1982, Ser. No. 378,701
Int. Cl.³ C07D *311/78*
U.S. Cl. 549—344 **14 Claims**

1. A dihydrofuorochormone of formula I:



I

wherein R_1 and R_2, being the same or different, are individually:

(a) C_1–C_6 alkyl,
(b) trifluoromethyl,
(c) C_5–C_{10} cycloalkyl with the proviso that the cycloalkyl ring is C_5–C_7,
(d) C_2–C_8 alkylaminoalkyl,
(e) C_2–C_8 alkoxyalkyl,
(f) C_2–C_8 alkylthioalkyl,
(g) C_2–C_8 alkylsulfinylalkyl,
(h) C_2–C_8 alkylsulfonylalkyl,
(i) C_7–C_{12} phenoxyalkyl optionally substituted on the phenyl ring by one, 2, or 3,
  (i) hydroxy,
  (ii) C_1–C_3 alkoxy,
  (iii) C_1–C_3 alkyl,
  iv) trifluoromethyl,
  (v) halo which is fluoro, chloro, or bromo, with the proviso that no more than two such substituents are other than alkyl,
(j) C_7–C_{12} phenylthioalkyl optionally substituted on the phenyl ring by one, 2, or 3,
  (i) hydroxy,
  (ii) C_1–C_3 alkoxy,
  (iii) C_1–C_3 alkyl,
  (iv) trifluoromethyl,
  (v) halo which is fluoro, chloro, or bromo, with the proviso that not more than two such substituents are other than alkyl,
(i) phenyl optionally substituted by one, 2, or 3,
  (i) hydroxy,
  (ii) C_1–C_3 alkoxy,
  (iii) C_1–C_3 alkyl,
  (iv) trifluoromethyl,
  (v) halo which is fluoro, chloro, or bromo, with the
(l) C_7–C_{12} aralkyl optionally substituted on the aromatic ring by one, 2, or 3,
  (i) hydroxy,
  (ii) C_1–C_3 alkoxy,
  (iii) C_1–C_3 alkyl,
  (iv) trifluoromethyl,
  (v) halo which is fluoro, chloro, or bromo, with the proviso that not more than two such substituents are other than alkyl,
(m) 2- or 3-furanyl optionally substituted by
  (i) hydroxy,
  (ii) C_1–C_3 alkoxy,
  (iii) C_1–C_3 alkyl,
  (iv) trifluoromethyl,
  (v) halo which is fluoro, chloro, or bromo, with the proviso that not more than two such substituents are other than alkyl,
(n) 2- or 3-thenyl optionally substituted by
  (i) hydroxy,
  (ii) C_1–C_3 alkoxy,
  (iii) C_1–C_3 alkyl,
  (iv) trifluoromethyl,
  (v) halo which is fluoro, chloro, or bromo, with the proviso that not more than two such substituents are other than alkyl, or
(o) $—CH_2NR_8R_9$ wherein R_8 and R_9, being the same or different, are individually,
  (i) hydrogen,
  (ii) C_1–C_8 alkyl,
  (iii) C_5–C_{10} cycloalkyl,
  (iv) C_7–C_{12} aralkyl, or
  (v) phenyl optionally substituted by one, 2, or 3
    (a) hydroxy,
    (b) C_1–C_3 alkoxy,
    (c) C_1–C_3 alkyl,
    (d) trifluoromethyl,
    (e) halo which is fluoro, chloro, or bromo, with the proviso that not more than two such substituents are other than alkyl, or wherein R_8 and R_9 are taken together with the nitrogen to form a saturated or unsaturated heterocyclic amine ring selected from the group consisting of thiazolidine, 3-piperidine methanol, 2-piperidine methanol, 3-piperidine ethanol, 2-piperidine ethanol, 1-piperizinepropanol, 4-phenyl-1,2,3,6-tetrahydropyridine, 4-phenylpiperidine, proline, 3-pyrolidinol, tetrahydrofurfurylamine, 3-pyrroline, thiazolidine-4-carboxylic acid, thiomorpholine, morpholine, 2-methylpiperidine, 3-methylpiperidine, 4-methylpiperidine, N-methylpiperazine, and 1-methylhomopiperazine, said heterocyclic amine ring being optionally substituted by C_1–C_4 alkyl, C_2–C_8 alkylthiomethyl, C_2–C_8 alkoxymethyl, C_1–C_4 hydroxymethyl or phenyl; or

wherein R_1 and R_2 are taken together and form a bivalent moiety which is:

(a) $—CH_2—(CH_2)_a—CH_2—$ wherein the integer "a" is zero to 5;
(b) $—CH_2—(CH_2)_b—X—(CH_2)_c—CH_2—$

wherein the integer "b" is zero and the integer "c" is zero, one, 2, or 3 or the integer "b" is one and the integer "c" is zero, one, or 2, and wherein X is oxa (—O—), thia (—S—), or $—N(R_{10})—$ wherein R_{10} is
  (i) hydrogen,
  (ii) C_1–C_8 alkyl,
  (iii) C_5–C_{10} cycloalkyl,
  (iv) C_7–C_{12} aralkyl, or
  (v) phenyl optionally substituted by one, 2, or 3
    (a) hydroxy,
    (b) C_1–C_3 alkoxy,
    (c) C_1–C_3 alkyl,
    (d) trifluoromethyl,
    (e) halo which is fluoro, chloro, or bromo, with the proviso that not more than two such substituents are other than alkyl;

wherein R_3 is hydrogen, or C_1–C_4 alkoxy and R_4 is hydrogen or C_1–C_4 alkoxy, with the provisos that one of R_3 and R_4 is hydrogen only when the other is other than hydrogen and R_3 and R_4 are the same or different.

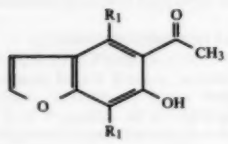
4,434,296

PROCESS FOR PREPARING INTERMEDIATES FOR ANTIATHEROSCLEROTIC COMPOUNDS

Ronald B. Gammill, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

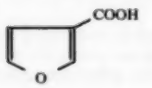
Filed May 17, 1982, Ser. No. 378,687
Int. Cl.³ C07D *307/79*
U.S. Cl. 549—471 **1 Claim**

1. A process for preparing a compound of formula XI



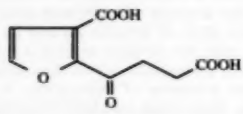
XI

wherein R_1 is C_1–C_4 alkyl which comprises:
(1) reaching the lithium dianion of a compound of formula X



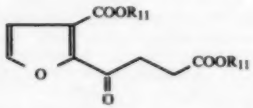
X

with succinic anhydride;
(2) C_1–C_4 alkyl esterifying the resulting formula XII



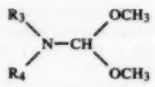
XII

ketodiacid of step (1);
(3) reacting the resulting formula XIII



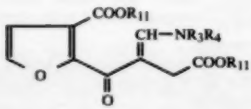
XIII

ketodiester of step (2), wherein R_{11} is C_1–C_4 alkyl, with an amide acetal of formula XIV



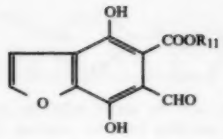
XIV

wherein R_3 and R_4, being the same or different, are C_1–C_4 alkyl;
(4) cyclizing of the resulting formula XV



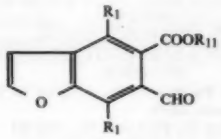
XV

compound of step (3), wherein R_3, R_4, and R_{11} are as defined above;
(5) di-(C_1–C_4)-alkylating the resulting formula XVI



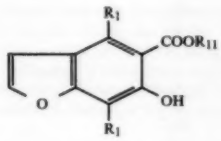
XVI

benzofuran of step (4);
(6) oxidizing the resulting formula XVII



XVII

compound of step (5), and
(7) reducing the resulting formula XVIII



XVIII

compound of step (6) to the formula XI compound.

4,434,297

PROCESS FOR THE PREPARATION OF TRIFLUOROETHANOL

Gary W. Astrologes, Hackensack, N.J., assignor to Halocarbon Products Corporation, Hackensack, N.J.

Continuation of Ser. No. 246,831, Mar. 23, 1981, abandoned.
This application Aug. 30, 1982, Ser. No. 413,008
Int. Cl.³ C07C *67/00, 17/10, 29/09*
U.S. Cl. 560—236 **9 Claims**

1. A process for the preparation of 2,2,2-trifluoroethanol which comprises reacting 2-chloro-1,1,1-trifluoroethane with an alkali metal salt of carboxylic acid at least about 130° C. in substantially anhydrous N-methyl-2-pyrrolidone thereby to form the carboxylic acid ester of 2,2,2-trifluoroethanol and alkali metal chloride, reacting the ester with the hydroxide or a basic salt of the alkali metal in water thereby to form 2,2,2-trifluoroethanol and the alkali metal salt of the carboxylic acid and separating the 2,2,2-trifluoroethanol.

9. The process which comprises reacting 2-chloro-1,1,1-trifluoroethane with an alkali metal salt of a carboxylic acid at about 130° to 200° C. in substantially anhydrous N-methyl-2-pyrrolidone thereby to form alkali metal chloride and the carboxylic acid ester of 2,2,2-l **-trifluoroethanol, and separating the ester from the alkali metal chloride.**

4,434,298

OXYDEHYDROGENATION OF ISOBUTYRIC ACID AND ITS LOWER ALKYL ESTERS

Ferdinand A. Ruszala, Columbus, Ohio, assignor to Ashland Oil, Inc., Ashland, Ky.

Filed Nov. 9, 1981, Ser. No. 319,172
Int. Cl.³ C07C *51/377, 57/05, 67/317, 69/54*
U.S. Cl. 562—599 **3 Claims**

1. In a process for the catalytic conversion of isobutyric acid or a lower alkyl ester thereof to the corresponding α,β-olefinically unsaturated derivative of oxydehydrogenation wherein a catalyst is contacted with a gaseous feed stream containing said

acid or ester and molecular oxygen at a temperature between about 300° and 1000° C., the improvement comprising using as catalyst a material having the gram-atom empirical formula $Fe_aTi_bO_x$ wherein a is b 0.25 to 3, b is 0.25 to 1, and x represents a number determined by satisfying the sum of the unshared positive valences of the other elements shown in the formula.

4,434,299

PRODUCTION OF AROMATIC AMINES USING CRYSTALLINE SILICATE CATALYSTS

Clarence D. Chang, Princeton, N.J., and William H. Lang, Richmond, Vt., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 12, 1982, Ser. No. 440,927
Int. Cl.³ C07C *85/06, 85/02*
U.S. Cl. 564—396 8 Claims

1. In a process for the production of aromatic amines by reaction of alicyclic alcohols, ketones and mixtures thereof with ammonia in the presence of a catalyst, the improvement which comprises utilizing as a catalyst a crystalline silicate zeolite having a silica to alumina ratio of at least about 12 and a constraint index of about 1 to 12.

4,434,300

METHANOL AMINATION

Michel Deeba, Emmaus; William J. Ambs, Swarthmore, and Robert N. Cochran, West Chester, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Sep. 13, 1982, Ser. No. 417,293
Int. Cl.³ C07C *85/06*
U.S. Cl. 564—479 8 Claims

1. In a process for producing methylamines by reacting of methanol with ammonia in the presence of a catalyst, the method for improving methanol conversion rates which comprises reacting the methanol and ammonia under conversion conditions in the presence of a crystalline aluminosilicate catalyst which irreversibly adsorbs at least 0.5 millimoles of ammonia per gram of catalyst at about 200° C., has a silicon to aluminum ratio of at least about 2.0, and has a mercury intrusion volume of at least 0.3 cc mercury per gram of catalyst at 60,000 psia.

4,434,301

PRODUCTION OF LOW COLOR REFINED ISOPHORONE

Anthony J. Papa, St. Albans, W. Va., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Aug. 25, 1982, Ser. No. 411,280
Int. Cl.³ C07C *45/85;* B01D *3/38*
U.S. Cl. 568—366 9 Claims

1. Method of refining crude isophorone made by the vapor phase reaction of acetone over a heterogeneous aldol condensation catalyst which comprises contacting said isophorone with aqueous caustic at a temperature of about 140° C. to about 200° C., washing the treated isophorone with water until the wash water has a pH of about 7 and recovering refined isophorone by a fractional distillation.

4,434,302

PROCESS AND CATALYST FOR PERFORMING HYDROFORMYLATION REACTIONS

Nicolaas A. De Munck, Delft, and Joseph J. F. Scholten, Sittard, both of Netherlands, assignors to Stamicarbon B.V., Geleen, Netherlands

Filed May 19, 1981, Ser. No. 265,222
Claims priority, application Netherlands, May 28, 1980, 8003059
Int. Cl.³ B01J *31/08, 31/10;* C07C *5/24*
U.S. Cl. 568—454 8 Claims

1. A process for converting an olefinically unsaturated compound to a mixture of essentially normal and iso-aldehydes with carbon monoxide and hydrogen at an elevated temperature in the presence of a catalyst comprising a macroreticular organic polymer carrier containing phosphine or phosphite groups that act as ligands for a catalytically organometallic complex, the process comprising the steps of:

(a) preparing said catalyst by a process comprising the steps of:

(i) phosphochlorinating said polymer with phosphorous trichloride in the presence of a borontrifluoride complex, to form chlorophosphonyl groups bound to said polymer;

(ii) converting the chlorophosphonyl groups bound to said polymer into phosphine or phosphite groups with at least one of an alkyl hydrocarbon compound and an alkali alcoholate;

(iii) reacting the product of step (ii) with a compound of a transition metal, a complex of a transition metal, or mixture thereof to form a catalytically active organometallic complex; and

(b) converting said olefinically unsaturated compound in the gas phase to a mixture of essentially normal and iso-aldehydes with carbon monoxide and hydrogen at an elevated temperature in the presence of the catalyst prepared in accordance with step (a).

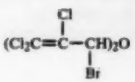
4,434,303

PREPARATION AND USE OF BIS-(1-BROMO-2,3,3-TRICHLORO-2-PROPENYL) ETHER

Junichi Saito, and Toyohiko Kume, both of Tokyo, Japan, assignors to Nihon Tokushu Noyaku Seizo K.K., Tokyo, Japan

Division of Ser. No. 288,443, Jul. 30, 1981, Pat. No. 4,392,929, which is a division of Ser. No. 110,051, Jan. 7, 1980, Pat. No. 4,317,937. This application Jan. 7, 1983, Ser. No. 456,461
Claims priority, application Japan, Jan. 24, 1979, 54-6015
Int. Cl.³ C07C *43/15, 43/17*
U.S. Cl. 568—686 1 Claim

1. Bis-(1-bromo-2,3,3-trichloro-2-propenyl) ether of the formula



4,434,304

SYNTHESIS OF TRINITROPHLOROGLUCINOL

Albert A. DeFusco, Jr.; Arnold T. Nielsen, and Ronald L. Atkins, all of Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 15, 1982, Ser. No. 434,460
Int. Cl.³ C07C *79/30*
U.S. Cl. 568—710 4 Claims

1. A method of making trinitrophloroglucinol comprising the steps of:

cooling a reaction mixture of phloroglucinol and sulfuric acid;

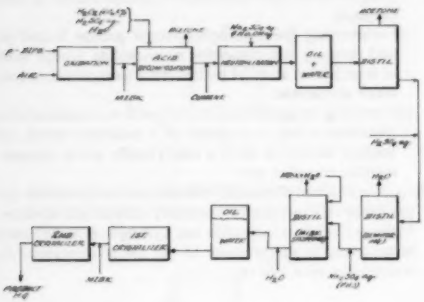
slowly adding to said reaction mixture a solution of nitric acid and sulfuric acid at a rate which maintains a reaction temperature of below 8° C.; and

stirring said reaction mixture until precipitate of said trinitrophloroglucinol forms.

4,434,305
PROCESS FOR PRODUCTION OF HYDROQUINONE

Nobuo Kurosaka, Yamaguchi; Makoto Yasuda, Iwakuni, and Tadateru Murakami, Otake, all of Japan, assignors to Mitsui Petrochemicals Industry, Ltd., Tokyo, Japan

Filed Dec. 1, 1981, Ser. No. 326,277
Claims priority, application Japan, Dec. 5, 1980, 55-170878
Int. Cl.³ C07C 37/08
U.S. Cl. 568—768 13 Claims



1. A process for producing hydroquinone comprising the sequential steps of:

(1) decomposing p-diisopropylbenzene dihydroperoxide in the presence of a water-soluble acid catalyst selected from sulfuric acid, phosphoric acid, and perchloric acid at a temperature of about 20° C. to about 90° C. while maintaining the hydroperoxide concentration within the range of about 0.1 to about 1% by weight;

(2) distilling the reaction mixture, after removing the acid catalyst therefrom, whereby low boiling point components contained in the reaction mixture are removed from the reaction mixture;

(3) further subjecting the remaining hydroperoxide from decomposition step (1) to an acid decomposition inside the distillation column, or in a downstream portion of the distillation column, and removing the low boiling point components, including water, whereby the content of the hydroperoxide is decreased; and

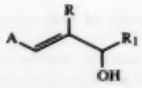
(4) removing the thus formed hydroquinone from the distillation residue.

4,434,306
PERFUME COMPOSITION

Toyohiko Kobayashi, and Haruki Tsuruta, both of Kanagawa, Japan, assignors to Takasago Perfumery Co., Ltd., Tokyo, Japan

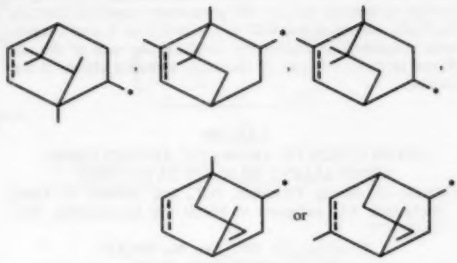
Filed Dec. 14, 1981, Ser. No. 330,358
Claims priority, application Japan, Dec. 17, 1980, 55-178308
Int. Cl.³ C07C 35/22, 35/24, 35/26, 35/28
U.S. Cl. 568—820 5 Claims

1. A perfume compound comprising at least one bicyclo[2,2,2]octane or bicyclo[2,2,2]octene derivative represented by formula (I)



(I)

wherein R is a hydrogen atom or a methyl group, R_1 is a hydrogen atom, a methyl group, or an ethyl group, and A is



wherein the dotted line indicates the position of either a double bond or a single bond, and the asterisk* indicates the position of bonding to the remaining portion of formula (I).

4,434,307
INHIBITING POLYMERIZATION OF VINYL AROMATIC MONOMERS

Richard F. Miller, Humble, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 27, 1982, Ser. No. 453,070
Int. Cl.³ C07C 7/18
U.S. Cl. 585—4 10 Claims

1. A composition comprised of a vinyl aromatic compound and an amount effective to inhibit polymerization of said vinyl aromatic compound of

(1) at least one hydroxylamine containing two N-substituted hydrocarbon groups each of which contains an aromatic radical, and

(2) at least one mono- or ditertiary alkyl dihydroxybenzene compound selected from mono- and ditertiary alkylcatechols and mono- and ditertiary alkylhydroquinones.

4,434,308
MANUFACTURE OF SYNTHETIC LUBRICANT ADDITIVES FROM INTERNAL OLEFINS USING BORON TRIFLUORIDE CATALYSIS

John M. Larkin; Lewis W. Watts, Jr., and Edward T. Marquis, all of Austin, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Apr. 28, 1982, Ser. No. 372,492
Int. Cl.³ C07C 1/16, 5/00
U.S. Cl. 585—10 23 Claims

1. A process for oligomerizing mono olefins comprising contacting a mixture of olefins having between 9 and 24 carbon atoms, inclusive, and having 99 weight percent or more of internal olefins, where the double bond of the olefin is randomly distributed throughout the carbon chain with a catalyst comprising boron trifluoride at a temperature between about 25° and about 150° C. sufficient to effect oligomerization of said olefins.

4,434,309
OLIGOMERIZATION OF PREDOMINANTLY LOW MOLECULAR WEIGHT OLEFINS OVER BORON TRIFLUORIDE IN THE PRESENCE OF A PROTONIC PROMOTER

John M. Larkin, and Walter H. Brader, Jr., both of Austin, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Jun. 18, 1982, Ser. No. 389,737
Int. Cl.³ C07C 1/16, 5/00
U.S. Cl. 585—10 20 Claims

1. A process for oligomerizing mono olefins comprising contacting a mixture of alpha mono olefins which consists essentially of greater than 50 weight percent of at least one low molecular weight alpha olefin which is 1-butene and less than

50 weight percent of at least one higher molecular weight alpha olefin having 8 to 18 carbon atoms, with a catalyst comprising boron trifluoride in the presence of an organic, protonic promoter selected from the group consisting of alcohols and carboxylic acids at a temperature in the range of about 25° to 75° C. and a pressure that is sufficient to maintain a liquid phase reaction.

4,434,310

PROCESS FOR THE ISOMERIZATION OF ISOLATED DOUBLE BONDS TO CONJUGATED DOUBLE BONDS IN OPTIONALLY SUBSTITUTED CYCLOOCTADIENES

Wolfgang Kampf, Haltern, Fed. Rep. of Germany, assignor to Chemische Werke Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Jan. 13, 1983, Ser. No. 457,550

Claims priority, application Fed. Rep. of Germany, Jan. 13, 1982, 3200783

Int. Cl.³ C07C *5/30*

U.S. Cl. 585—377 **18 Claims**

1. In a process for the isomerization of isolated double bonds to conjugated double bonds in optionally substituted cyclooctadienes using as a catalyst an alkali metal or alkaline earth metal amide, optionally in the presence of a solvent, the improvement wherein the alkali metal or alkaline earth metal amide is prepared in situ with the substantial exclusion of moisture, under a protective gas atmosphere and in the presence of the cyclooctadiene to be isomerized; and wherein the isomerization is conducted at a temperature of 70°–200° C.

4,434,311

CONVERSION OF ALKYCYCLOPENTANES TO AROMATICS

Waldeen C. Buss, Kensington, and Thomas R. Hughes, Orinda, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 344,570, Feb. 1, 1982, abandoned, and a continuation-in-part of Ser. No. 344,572, Feb. 1, 1982. This application Sep. 20, 1982, Ser. No. 420,541

Int. Cl.³ C07C *2/64*

U.S. Cl. 585—444 **15 Claims**

1. A method of dehydroisomerization of alkylcyclopentanes to produce aromatics comprising contacting said alkylcyclopentanes under dehydroisomerization conditions with a catalyst comprising:

(a) a large-pore zeolite;

(b) at least one Group VIII metal; and

(c) an alkaline earth metal selected from the group consisting of barium, strontium and calcium.

4,434,312

PREPARATION OF LINEAR OLEFIN PRODUCTS

Arthur W. Langer, Jr., Watchung, N.J., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 882,946, Mar. 2, 1978, Pat. No. 4,396,788, which is a continuation of Ser. No. 232,618, Mar. 7, 1972, abandoned, which is a continuation-in-part of Ser. No. 783,699, Dec. 13, 1968, Pat. No. 3,662,021, which is a continuation-in-part of Ser. No. 562,089, Jul. 1, 1966, abandoned, which is a continuation-in-part of Ser. No. 428,836, Jan. 28, 1965, abandoned, which is a continuation-in-part of Ser. No. 55,845, Sep. 8, 1960, Pat. No. 3,168,588. This application Jan. 2, 1981, Ser. No. 222,008

The portion of the term of this patent subsequent to Apr. 29, 1986, has been disclaimed.

Int. Cl.³ C07C *2/22*

U.S. Cl. 585—523 **8 Claims**

1. A process for preparing an olefinic reaction product comprising at least 50 wt. % C_{20+} waxes which consists of polymerizing an ethylene containing gas in the presence of:

(a) an aluminum alkyl compound having the formula R_2AlX', wherein X' is selected from the group consisting of fluorine, chlorine, bromine and iodine, and R is an alkyl, cycloalkyl or aralkyl group;

(b) an aluminum alkyl compound having the formula $RAlX_2$, wherein X is selected from the group consisting of chlorine and bromine, and R is an alkyl, cycloalkyl or aralkyl group; and

(c) a zirconium compound having the formula ZrX_nY_{4-n}, wherein X is selected from the group consisting of chlorine and bromine, Y is selected from the group consisting of alkoxide, aryloxide, carboxylate, and enolate, n=0 to 4, the ratio of a/c is 1 the ratio of b/c is: 0 when n=4; 0 to 2 when n=3; 0 to 3 when n=2; 2 to 4 when n=1; and 2 to 6 when n=0, in the presence of a diluent at a reaction temperature of 100° C. to 180° C. and an ethylene pressure above 50 psig.

4,434,313

PREPARATION OF LINEAR OLEFIN PRODUCTS

Arthur W. Langer, Jr., Watchung, N.J., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 330,479, Dec. 14, 1981, Pat. No. 4,377,720. This application Dec. 29, 1982, Ser. No. 454,380

The portion of the term of this patent subsequent to Mar. 22, 2000, has been disclaimed.

Int. Cl.³ C07C *3/21, 3/02*

U.S. Cl. 585—527 **9 Claims**

1. A process for preparing linear alpha olefins and waxes having a total product $\overline{M}_n$ in the range 200 to 700, which comprises polymerizing an ethylene-containing gas in the presence of the reaction product of a Zr metal compound having the formula ZrX_aA_b wherein a=3 or 4, b=0 or 1 and a+b=4 and X=Cl or Br and A is Cl, Br, I, OR or OOCR with an aluminum cocatalyst selected from the group consisting of R_2AlOR' and R_2AlNR_2'', wherein R is a primary, secondary or tertiary alkyl group having about 1 to about 20 carbon atoms and R' or R'' is a primary, secondary or tertiary alkyl group having about 1 to about 20 carbon atoms or an aryl or substituted aryl group, in the presence of a diluent at a temperature of about 50° to 200° C. and an ethylene pressure above about 3.5 MPa, wherein the $\overline{M}_n$ of said reaction product, is controlled by the molar ratio of aluminum cocatalyst/Zr, said molar ratio being less than about 10.

4,434,314

PREPARATION OF OLEFINS FROM METHANOL/DIMETHYL ETHER

Wolfgang Hoelderich; Wolf D. Mross, both of Frankenthal, and Matthias Schwarzmann, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Sep. 13, 1982, Ser. No. 417,523

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1981, 3136984

Int. Cl.³ C07C *1/00*

U.S. Cl. 585—640 **10 Claims**

1. In a process for the preparation of olefins from methanol and/or dimethyl ether by conversion in the presence of a zeolite catalyst at elevated temperature, the improvement which comprises:

carrying out the reaction with the addition of a small amount of about 1 to 300 ppm of a substance which has a Lewis basicity as an electron donor.

4,434,315
PROCESS FOR ISOMERIZING OLEFINS

Bernard Juguin, Rueil-Malmaison, and Jean Miquel, Paris, both of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed May 21, 1982, Ser. No. 380,857
Claims priority, application France, May 21, 1981, 81 10312
Int. Cl.³ C07C 5/23
U.S. Cl. 585—671 **12 Claims**

1. A process for isomerizing a linear C_{4-20} ethylenic hydrocarbon to a branched C_{4-20} ethylenic hydrocarbon, comprising contacting an olefinic hydrocarbon charge containing said linear C_{4-20} ethylenic hydrocarbon with steam and an isomerization catalyst; wherein said catalyst is an alumina catalyst which further comprises 0.5–10% by weight of silica, and 5 ppm–2% by weight of at least one metal or metal compound, said metal being palladium, chromium, nickel, copper, manganese or silver; and wherein the molar ratio H_2O/hydrocarbons is 0.1–10.

4,434,316
SEPARATION OF ALKADIENES FROM ALKADIENES

Willie J. Barnette, Orange, Tex., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Filed Mar. 25, 1983, Ser. No. 478,997
Int. Cl.³ C07C 7/00
U.S. Cl. 585—833 **6 Claims**

1. A process for separating alkenes from a mixture comprising alkenes and alkadienes which process comprises contacting the mixture with hydrogen cyanide in the presence of a zerovalent nickel complex as a catalyst under hydrocyanation conditions at a temperature in the range 40°–200° C. and at a pressure in the range 0.1 –5 MPa in the liquid phase, whereby the hydrogen cyanide reacts with at least a portion of the alkadiene present to form the corresponding nitrile and thereafter separating the unreacted alkenes from the nitrile reaction product.

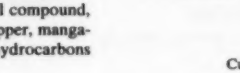
4,434,317
SEPARATION AND RECOVERY OF UNSATURATED HYDROCARBONS BY COPPER (I) COMPLEXES

Gerald Doyle, Whitehouse Station; Roy L. Pruett, New Providence, and David W. Savage, Lebanon, all of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed May 6, 1983, Ser. No. 492,225
Int. Cl.³ C07C 7/156
U.S. Cl. 585—845 **12 Claims**

1. A process for separating alkene, alkyne or mixture thereof from a feedstream without copper metal formation which comprises the steps of:

(a) contacting the feedstream with a solution of a cuprous fluorinated acetylacetonate of the formula



where R^1 is C_1–C_6 fluoroalkyl, C_1–C_8 alkyl, C_4–C_6 heretocycle containing O, S, or N or C_6–C_{10} aryl, R^2 is H or C_1–C_6 alkyl with the proviso that R^1 and R^2 together with the carbons to which they are attached may be joined together to form a C_6 ring and n is an integer from 1 to 8, in an organic solvent containing a stabilizing agent at a temperature sufficient to remove at least one of alkene or alkyne by forming a Cu(I) complex of the formula

where R^1, R^2 and n are defined above, x and y are 1 or 2, and L is alkene or alkyne, said stabilizing agent being characterized by replacing L in the first Cu(I) complex thereby forming a second Cu(I) complex which is stable at temperatures wherein the first Cu(I) complex decomposes through loss of alkene or alkyne,

(b) heating the resulting mixture to a temperature sufficient to decompose the first Cu(I) complex through loss of alkene or alkyne whereby the stabilizing agent replaces alkene or alkyne in said first Cu(I) complex and copper metal formation is prevented by formation of the second Cu(I) complex, and

(c) separating the alkene, alkyne or mixture thereof.

4,434,318

SOLAR CELLS AND METHOD

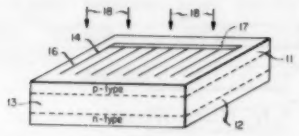
James F. Gibbons, Palo Alto, Calif., assignor to Sera Solar Corporation, Santa Clara, Calif.

Filed Mar. 25, 1981, Ser. No. 247,611

The portion of the term of this patent subsequent to May 26, 1998, has been disclaimed.

Int. Cl.³ H01L *31/06, 31/18*

U.S. Cl. 136—258 9 Claims



1. A solar cell comprising n-type and p-type silicon single crystal or polycrystalline collecting semiconductor layers separated by a truly amorphous semiconductor layer that serves as a layer which absorbs the optical energy and generates carriers.

4,434,319

POF CABLE HAVING OUTER PIPE WITH CURVED OFFSET SECTIONS TO ACCOMMODATE EXPANSION OF THE CORE

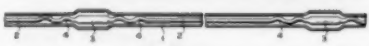
Yoshiaki Gomi, Kasugai; Takahiro Hirata, Gifu; Michio Takaoka, Chiba; Tsuneaki Mohtai, Yachiyo, and Kazuya Akashi, Tokyo, all of Japan, assignors to The Chuba Electric Power Company Inc., Nagoya and The Fujikura Cable Works, Ltd., Tokyo, both of, Japan

Filed Aug. 31, 1981, Ser. No. 298,160

Claims priority, application Japan, Sep. 5, 1980, 55-123273; Sep. 5, 1980, 55-123274

Int. Cl.³ H01B *9/06*

U.S. Cl. 174—13 9 Claims



1. A POF cable line comprising:

a pipe having a generally constant diameter and containing insulating oil therein;

a cable core within the pipe, said core lying substantially straight in the pipe when the cable line is electrically unloaded, said pipe having at least one curved offset section having a diameter substantially the same as said first mentioned diameter and positioned along the pipe to accommodate longitudinal thermal expansion of said cable core by providing controlled snaking of said cable core with respect to said pipe, said pipe having an inner diameter sufficiently larger than an outer diameter of the cable core to permit said at least one curved offset section to accommodate said longitudinal thermal expansion.

4,434,320

CONTRACTIBLE CONDUIT SEALING CONNECTOR

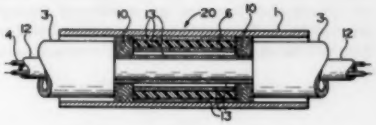
Gary S. Klein, Bedford Heights, and William J. Herbert, Mantua, both of Ohio, assignors to Eaton Corporation, Cleveland, Ohio

Filed Feb. 22, 1982, Ser. No. 350,980

Int. Cl.³ H02G *3/04*

U.S. Cl. 174—23 R 17 Claims

1. An improved connector assembly for connecting the ends of at least two metal conduits together having at least one electrical conductor extending therebetween, said connector of the type comprising a sleeve made from a heat recoverable metallic material having a chamber therewithin enclosed by a wall of the sleeve having an inner and outer surface with at least a portion of the inner surface facing towards the conductor, said sleeve having openings therein communicating with the chamber that are dimensionally adapted to enable the ends of the conduits to be respectively inserted therethrough into the chamber while the sleeve is in an expanded state and permit a wall of the sleeve surrounding the openings to contract radially inwardly to secure the sleeve to the conduits upon exposure of the sleeve to an amount of heat sufficient to cause the contraction thereof, wherein the improvement is characterized by; said chamber having an expandable material disposed therein that is adapted to expand into an expanded material in response to the exposure of the sleeve to the amount of heat sufficient to cause the contraction thereof and to engulf the conductor without damge thereto and fill the chamber sufficiently to provide a barrier against the flow of vapor through the conduits, and said sleeve having stopping means disposed within the chamber to prevent the expandable material from expanding into the ends of the conduits.



4,434,321

MULTILAYER PRINTED CIRCUIT BOARDS

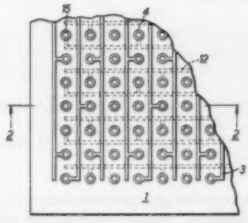
Dennis J. Betts, Goostray, England, assignor to International Computers Limited, Stevenage, England

Filed Feb. 9, 1982, Ser. No. 347,312

Claims priority, application United Kingdom, Feb. 9, 1981, 8103918

Int. Cl.³ H05K *1/11*

U.S. Cl. 174—68.5 3 Claims



1. A multilayer printed circuit board for forming prototype circuits including:

an insulating substrate;

first and second planar conductive potential distribution layers bonded one on either side of the insulating substrate;

a first insulating layer secured to the first planar conductive layer and supporting a plurality of first spaced parallel conductive tracks on an outer face of the structure;

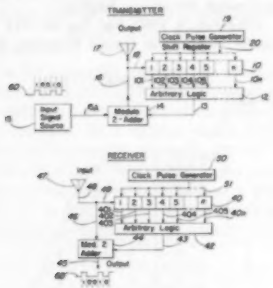
a second insulating layer secured to the second planar conductive layer and supporting a plurality of second spaced parallel conductive tracks on a further outer face of the structure opposite said one outer face, the second tracks extending perpendicular to said first tracks; and a plurality of conductive through connections extending between said outer faces of the structure and arranged in a pattern of rows and columns in positions located between adjacent conductive tracks, first ones of the conductive through connections being connected only to adjacent ones of said first conductive tracks, second ones of the conductive through connections being connected only to

adjacent ones of said second conductive tracks, third ones of the conductive through connections being connected only to the first planar conductive layer and fourth ones of the conductive through connections being connected only to the second planar conductive layer, whereby desired conductor configurations may be provided by interconnecting selected tracks by conductive links between conductive through connections which are connected to those selected tracks and selectively introducing discontinuities in said tracks and whereby desired potentials for the circuit configurations are distributed through the structure by the first and second conductive layers and the third and fourth conductive through connections respectively.

4,434,322
CODED DATA TRANSMISSION SYSTEM

Philip J. Ferrell, Seattle, Wash., assignor to Racal Data Communications Inc., Miami, Fla.

Continuation of Ser. No. 481,021, Aug. 19, 1965, abandoned. This application Jul. 23, 1981, Ser. No. 286,356
Int. Cl.³ H04L 9/00
U.S. Cl. 178—22.13 **40 Claims**



35. A data decryption apparatus for decrypting an encrypted information-containing digital data signal which was encrypted for transmission to the data decryption apparatus, comprising:

a multistage shift register having an input stage and a total of n stages, with n equal to the number of stages in a shift register used for encryption;

a logic means, having n inputs, each connected a respective one of the n stages of the shift register, for providing on its output the same unique binary output responsive to the condition of the contents of each stage of the shift register, as is provided by an identical logic means used for encrypting the information-containing digital data signal for transmission;

a modulo-two adder having first and second inputs, and one output;

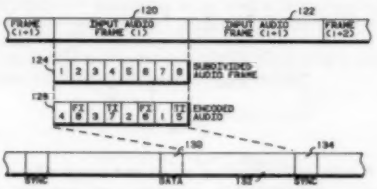
means for coupling the encrypted information-containing data signal as received to the input stage of the shift register and to the first input of the modulo-two adder;

the output of the logic means is connected to the second input of the modulo-two adder and the output of the modulo-two adder comprises the information-containing digital data signal which was encrypted for transmission.

4,434,323
SCRAMBLER KEY CODE SYNCHRONIZER

Stephen N. Levine, Schaumburg; Ezzat A. Dabbish, Buffalo Grove, and John P. Byrns, Schaumburg, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 29, 1981, Ser. No. 278,251
Int. Cl.³ H04K 1/00
U.S. Cl. 178—22.17 **17 Claims**



1. In a narrowband privacy communication system for communicating analog information, wherein frames of analog information are partitioned into subframes and subframes are scrambled to permit secure transmission, a key code synchronization method comprising the steps of:

(a) generating successive digital sequences containing time synchronization information and key synchronization information at a first station;

(b) scrambling each frame of the analog information such that the scrambling algorithm is derived from the key synchronization information;

(c) periodically transmitting throughout the scrambled transmission of analog information from the first station the digital sequences distributed between the scrambled frames of the analog information;

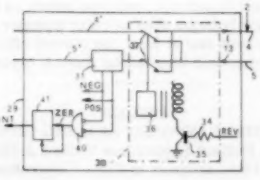
(d) detecting at a second station at least one transmitted digital sequence and the transmitted scrambled analog information;

(e) descrambling the scrambled analog information utilizing at least one of the digital sequences.

4,434,324
REVERSAL OF CONNECTIONS OF TELEGRAPHIC LINE WIRES UPON DETECTION OF UNWANTED POLARITY OF THE LOOP CURRENT

Giuseppe Boggio, Rivarolo, and Mario Lorenzi, Ivrea, both of Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy

Filed Jan. 27, 1982, Ser. No. 343,311
Claims priority, application Italy, Jan. 30, 1981, 67122 A/81
Int. Cl.³ H04L 25/02
U.S. Cl. 178—69 R **10 Claims**



1. A telegraphic communication system with automatic handling of irregularities in the connection of a transmission-reception line of a telegraphic station, the line normally carrying a predetermined current, comprising a polarity detector (31) in series with the line to detect the current polarity, and a device for reversing the connection of the line (30), characterised by checking means (84) operating in dependence upon the detector (31), for carrying out a check on the polarity of the

current in order to cause the reversing device (30) to operate if the result of this check is negative.

4,434,325

VOLUME CONTROL FOR AN AUDIO APPARATUS

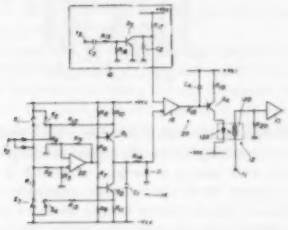
Kozo Kobayashi, Kodaira, and Mamoru Minamishima, Higashimurayama, both of Japan, assignors to Nakamichi Corporation, Tokyo, Japan

Filed Jul. 9, 1982, Ser. No. 396,772

Claims priority, application Japan, Jul. 16, 1981, 56-104679[U]

Int. Cl.³ H03G *3/02*

U.S. Cl. 381—104 **5 Claims**



1. A volume control for an audio apparatus comprising;

a capacitor charge and discharge circuit having a capacitor charged and discharged by a constant current in response to one of fade-in and fade-out operations;

a function generator to generate a signal having a logarithmic waveform periodically repeated;

control signal generating means to compare a voltage across said capacitor with said logarithmic waveform signal from said function generator to generate a control signal logarithmically varying in accordance with variation in said voltage across said capacitor;

and impedance control means to logarithmically change an impedance of an audio signal line in accordance with said control signal to logarithmically change the level of said audio signal in substance.

4,434,326

CIRCUIT ARRANGEMENT FOR ESTABLISHING AND TERMINATING A DATA CONNECTION

Klaus Koeck, Banknang; Wolfgang Bambach, Oberstenfeld; Gerhard Ruopp, and Frank Mikley, both of Backnang, all of Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-GmbH, Frankfurt, Fed. Rep. of Germany

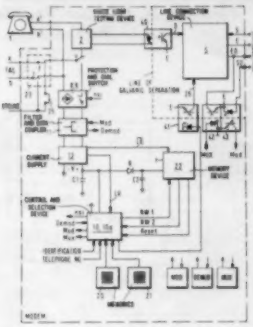
Filed Jul. 24, 1981, Ser. No. 286,584

Claims priority, application Fed. Rep. of Germany, Jul. 25, 1980, 3028236

Int. Cl.³ H04M *11/08*

U.S. Cl. 179—2 DP **9 Claims**

1. In a circuit arrangement for establishing and terminating a connection in a subscriber communication system, the arrangement including a data transmission device arranged to be connected to an associated subscriber line of the system and including a data terminal, a voice loop testing device connectable to the subscriber line, a line connection device supplied with operating voltage by the terminal, and connected to receive signals produced by the voice loop testing device, an automatic dialing device, a current supply connected to receive operating voltage from the subscriber line, a control device connected in the data transmission device and to the automatic dialing device for performing and monitoring the sequence of individual operating states of the data transmission device, and a memory unit connected to the control device for storing a representation of the present operating state of the data transmission device, the improvement wherein: the operating state representations stored in said memory unit are those required for reestablishment of an existing connection; and, said control device constitutes means responsive to a temporary interruption in the supply of operating voltage to said



current supply from the subscriber line for reading out from said memory unit, after such interruption has ended, the representations stored therein and for then reestablishing the connection existing before such interruption.

4,434,327

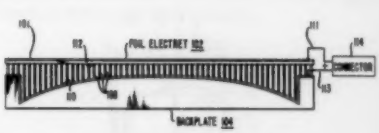
ELECTRET TRANSDUCER WITH VARIABLE ACTUAL AIR GAP

Ilene J. Busch-Vishniac, Highland Park; Robert L. Wallace, Jr., Warren, and James E. West, Plainfield, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 20, 1981, Ser. No. 323,684

Int. Cl.³ H04R *19/00, 19/04*

U.S. Cl. 179—111 E **12 Claims**



12. An acoustic transducer comprising

a backplate coated with a metal, and

a single foil suspended over said backplate, said foil being substantially parallel to said backplate along the width of said single foil at any point along the length of said single foil, the distance between said single foil and said backplate varying along said length according to a predetermined relationship,

the sensitivity of said acoustic transducer at any point on said single foil being inversely proportional to said distance at said point between said single foil and said backplate for producing a directional response pattern comprising a main lobe and a plurality of sidelobes substantially at a predetermined threshold level, and

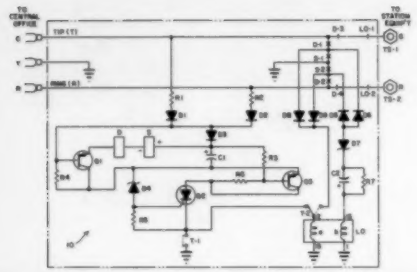
said single foil being constantly charged with a direct current bias.

4,434,328

REMOTELY ACTUATED TELEPHONE INSTRUMENT CONNECTION BLOCK HAVING INSTRUMENT LOCKOUT FEATURE

Gary C. Fields, 3825 Delmont Ave., Oakland, Calif. 94605

Filed Jun. 21, 1982, Ser. No. 390,404
Int. Cl.³ H04M *3/16*
U.S. Cl. 179—20 14 Claims



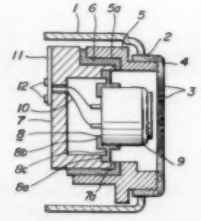
1. In a remotely activated loop testing connection block for disconnecting a telephone subscriber's service equipment from a telephone tip and ring line pair during a test interval in response to a first control signal sent from a telephone exchange, an improvement comprising a subscriber's equipment lockout circuit including switching means responsive only to a second control signal sent from said exchange during said test interval for lockingly disconnecting said equipment from said pair and thereafter for lockingly reconnecting said instrument to said pair in response to a subsequently sent restore control signal.

4,434,329

MICROPHONE DEVICE BUILT IN A TAPE RECORDER

Mitsuo Nasu, Tokyo, Japan, assignor to Olympus Optical Company Limited, Tokyo, Japan

Filed Feb. 12, 1982, Ser. No. 348,339
Claims priority, application Japan, Feb. 19, 1981, 56-22416[U]; Feb. 19, 1981, 56-22417[U]
Int. Cl.³ H04R *1/28*
U.S. Cl. 179—121 R 8 Claims



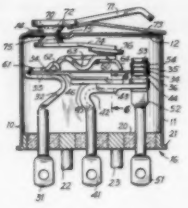
1. A microphone device arranged to be built in a tape recorder, comprising a casing portion of a tape recorder, a face member fixed on the casing portion and having a plurality of sound inlet holes, a first support member located inside the casing portion and supported by the face member for isolating vibrations of relatively low frequency, a second support member located inside the casing portion and supported by the first support member for isolating vibrations of relatively high frequency, and a microphone body supported by the second support member in operative relation to the face member.

4,434,330

HIGH TEMPERATURE SWITCH

Leo F. Geremia, Wallingford, Conn., assignor to Tri-tech, Inc., Waterbury, Conn.

Filed Apr. 9, 1981, Ser. No. 252,475
Int. Cl.³ H01H *21/04*
U.S. Cl. 200—67 DA 22 Claims



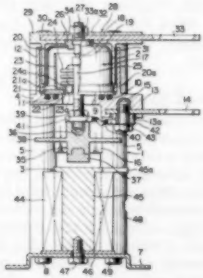
1. A switch mechanism for use in a high temperature environment comprising enclosure means defining an interior and an exterior and having a surface on which is formed a flex portion adapted for flex movement; electrodes extending into the interior of the enclosure means; an outer actuator having one end affixed at said flex portion on the exterior of the enclosure means and a remote free end; an inner actuator having one end affixed at said flex portion on the interior of the enclosure means and a remote free end; switch means in contact with the free end of said inner actuator and actuable between normal and actuated conditions for coupling said electrodes to selectively open and close in response to movement of the outer actuator; and helper spring means coupled to said outer actuator and biasing against said enclosure means when said outer actuator is depressed into an actuated position thereof for biasing said actuators to their position corresponding to the normal condition of said switch means.

4,434,331

VACUUM POWER INTERRUPTING DEVICE

Shinzo Sakuma, Yokohama; Hifumi Yanagisawa, Sagamihara; Kazuo Tokuhata, Yamanishi, and Hiroshi Miyagawa, Yokohama, all of Japan, assignors to Kabushiki Kaisha Meidensha and Kabushiki Kaisha GEMV AC, both of Tokyo, Japan

Filed Jan. 30, 1981, Ser. No. 230,286
Claims priority, application Japan, Feb. 4, 1980, 55-12181
Int. Cl.³ H01N *33/66*
U.S. Cl. 200—144 B 12 Claims



1. A vacuum power interrupting device with a vacuum vessel, the device including a vacuum interrupter comprising a stationary contact rod aligned with a movable contact rod, each said rod having, within the vacuum vessel, a respective electrical contact provided on an end of the associated rod extending into the vacuum vessel, the contact on the movable

contact rod being in contact with or separated from the contact on the stationary contact rod, and the vacuum vessel comprising a bell-shaped metallic casing having a radially extending portion provided at an open end thereof, and an insulating circular end plate hermetically brazed to the open end of the metallic casing;

the vacuum interrupter being mounted on a supporting portion integrally formed with an insulating supporting member;

a clamping member serving as a cover member of said insulating supporting member and having a retaining member integrally formed therewith, said retaining member extending axially to said vacuum vessel and arranged to fit within said supporting portion; and

a sealing member interposed between the vacuum vessel and said supporting portion,

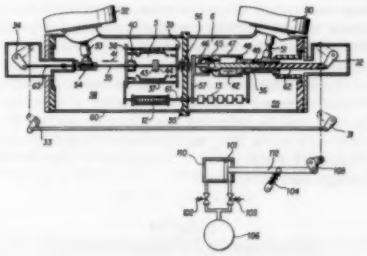
the axially extending end of said retaining member of said clamping member being pressed onto said radially extending portion of said bell-shaped casing in such a manner that the outer surface of the insulating end plate is in close contact with the surface of said supporting portion to affix the vacuum interrupter on said supporting portion.

4,434,332

HYBRID-TYPE INTERRUPTING APPARATUS

Satoru Yanabu, Machida, and Tohoru Tamagawa, Chigasaki, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

Filed Aug. 14, 1981, Ser. No. 292,819
Claims priority, application Japan, Aug. 14, 1980, 55-111024
Int. Cl.³ H01H *33/16*
U.S. Cl. 200—144 AP **5 Claims**



1. A current interrupting apparatus, comprising:

at least one vacuum interrupter means;

at least one gas-blast interrupter means coupled in series with said at least one vacuum interrupter means;

non-linear resistor means coupled in parallel with said vacuum interrupter means;

impedance means coupled in parallel with said at least one gas blast interrupter means;

high frequency current generator means coupled in parallel with the series combination of said at least one vacuum interrupter means and said at least one gas-blast interrupter means; and

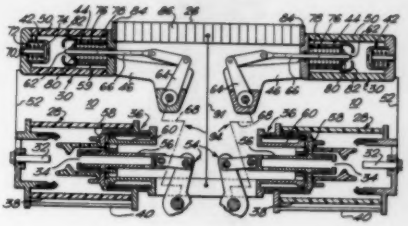
energy absorber means coupled in parallel with the series combination of said at least one vacuum interrupter means of said at least one gas-blast interrupter means.

4,434,333

CIRCUIT BREAKER DEVICE

Yutaka Kawasaki, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jun. 7, 1982, Ser. No. 386,092
Claims priority, application Japan, Sep. 4, 1981, 56-138356
Int. Cl.³ H01H *33/16*
U.S. Cl. 200—144 AP **4 Claims**



1. A circuit breaker device comprising: a tank filled with an insulating gas;

a pair of main contacts disposed in said tank, connected in series with each other and each having a movable contact and a fixed contact;

a pair of auxiliary contacts disposed in said tank, each having a movable contact and a fixed contact, an end terminal of one of said auxiliary contacts being connected with an end terminal of said series connected main contacts and an end terminal of the other of said auxiliary contacts being connected with the other end terminal of said series connected main contacts, each of said auxiliary contacts including a resistance annularly disposed around said movable contact of said auxiliary contact, said movable contact passing through and electrically contacting the annular resistance;

a resistance, disposed in said tank, connected to the other end terminals of said auxiliary contacts, said resistance including an intermediate tap connected to a juncture point between said main contacts; and

operating means, including an insulated rod connected between said movable contacts of said main and auxiliary contacts, for closing and opening said pairs of main contacts and auxiliary contacts, said operating means cooperating with said pairs of contacts to close said auxiliary contacts before said main contacts.

4,434,334

CIRCUIT INTERRUPTER

Charles W. Tragesser, Murrysville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 2, 1980, Ser. No. 193,067
Int. Cl.³ H01H *33/70*
U.S. Cl. 200—148 R **6 Claims**

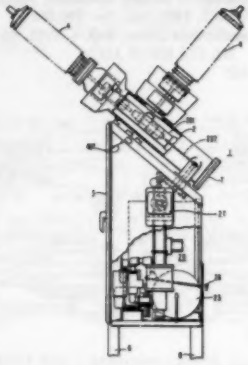
1. Circuit interrupter, comprising:

(a) a assembly with an insulating housing containing a compressed insulating gas and separable electrical contacts;

(b) a control means operable to open and close said separable electrical contacts including electrical and mechanical actuating means for operating said separable electrical contact; and

(c) a control housing for suppprting said control means and said interrupter assembly such that the interrupter assem-

bly has connected to it a rectilinear bushing means in a parallel relationship with the top of the control housing



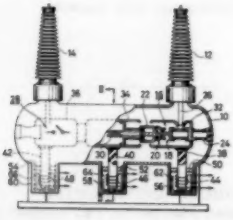
and a perpendicular bushing means in a perpendicular relationship with the top of the control housing.

4,434,335

COMPRESSED-GAS CIRCUIT INTERRUPTER WITH A HEATER

Ken-ichi Natsui, and Osamu Koyanagi, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 28, 1981, Ser. No. 229,064
Claims priority, application Japan, Jan. 28, 1980, 55-7839
Int. Cl.³ H01H *33/57*
U.S. Cl. 200—148 E **9 Claims**



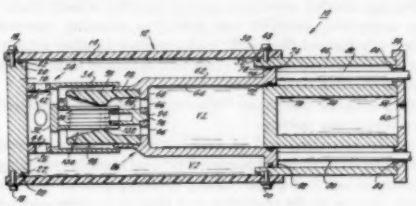
1. A compressed-gas circuit interrupter comprising:
a sealed chamber in which a compressed dielectric gas is confined;
an arc-extinguishing assemblage disposed interiorly of said chamber for carrying load current;
a heat radiation member mounted within said chamber for making a heat exchange with the dielectric gas;
a heater disposed at the outside of said chamber; and
a heat transfer member connected to said heat radiation member and said heater for transmitting heat generated by said heater to said heat radiation member through heat conduction.

4,434,336

LIQUID SF_6 INTERRUPTER WITH ARC ENERGY DRIVEN PISTON AND CONTACT

Ruben D. Garzon, Malvern, Pa., assignor to Brown Boveri Electric, Inc., Rolling Meadows, Ill.

Filed Aug. 12, 1981, Ser. No. 292,208
Int. Cl.³ H01H *33/88*
U.S. Cl. 200—150 G **9 Claims**



1. A circuit interrupter, comprising:
a housing containing a substantially incompressible dielectric material in the liquid phase at a pressure higher than the pressure immediately surrounding said housing;
stationary contact means in said housing;
movable contact means in said housing and movable therein between an engaged position, in which it engages said stationary contact means, and a disengaged position, in which it is physically spaced from and electrically isolated from said stationary contact means;
stationary piston means in said housing;
movable piston means secured to aid movable contact means and having a bore in which said stationary piston means is slidably received; the interior of said bore communicating with a region between said stationary and and said movable contact means to cause fluid flow into said region when said movable contact means is displaced from its said engaged position; said movable piston means having a piston member which has a first face exposed to said pressure of said dielectric material in the interior of said housing and having a second face exposed to said lower pressure immediately surrounding said housing;
sliding seal means disposed between said movable piston means and said stationary piston means for preventing flow of fluid between the volumes which include said first and second faces during contact interruption; and
control means for maintaining said movable contact means in said engaged position to maintain a current therethrough, and for releasing said movable contact means to allow it to move from said position engaged toward said disengaged position for interrupting a current flowing through said interrupter.

4,434,337

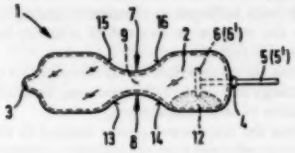
MERCURY ELECTRODE SWITCH

Otto Becker, Nuremberg, Fed. Rep. of Germany, assignor to W. Günther GmbH, Nuremberg, Fed. Rep. of Germany

Filed Jun. 24, 1981, Ser. No. 276,923
Claims priority, application Fed. Rep. of Germany, Jun. 26, 1980, 8016981[U]
Int. Cl.³ H01H *29/22*
U.S. Cl. 200—220 **6 Claims**

1. In a mercury switch composed of a closed tubular glass envelope and at least one pair of electrodes extending through one end of the envelope and presenting terminals located within the region enclosed by the envelope and adjacent the one end thereof, the improvement wherein said envelope is formed to have two indentations located opposite one another, spaced from the ends of said envelope, and spaced at a greater distance than said terminals from said one end, said indentations projecting toward one another to define, within the region enclosed by said envelope, a gap for the passage of mer-

cury between the ends of such region, and wherein said terminals are spaced apart in the direction of a plane which is disposed between said indentations and which is perpendicular to the direction in which said indentations project.



4,434,338

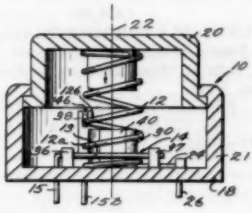
COIL SPRING SWITCH

Robert M. Rood, 7164 Victoria Rd., St. Paul, Minn. 55119

Filed Jan. 22, 1982, Ser. No. 341,605

Int. Cl.³ H01H *1/06*

U.S. Cl. 200—276 **40 Claims**



1. A switch comprising:

a first contact comprising generally helical conductive compression spring having at least one coil, said coil being displaced from a predetermined expanded position along a predetermined compression path by compression of said spring;

at least one second contact comprising a resilient conductive transverse members, adapted for flexing in the direction of said compression path, disposed outwardly of said spring and extending inwardly into said compression path in predetermined relation to said coil expanded position, said compression spring providing the sole significant positional bias in respect of said transverse member and said coil; and

means for selectively displacing said coil along said compression path to selectively effect a wiping contact between said transverse member and said coil.

4,434,339

MOUNTING FRAME EQUIPPED WTH DECORATIVE PLATE FOR MOUNTING SWITCH OR THE LIKE

Shigeo Ohashi, Tokyo, Japan, assignor to Nihon Kaiheiki Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 306,821, Sep. 29, 1981, Pat. No. 4,406,936. This application Sep. 28, 1982, Ser. No. 425,369

Claims priority, application Japan, Oct. 11, 1980, 55-145034[U]; Feb. 20, 1981, 56-23743[U]

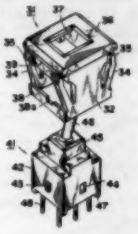
Int. Cl.³ H01H *9/00*

U.S. Cl. 200—295 **5 Claims**

1. A mounting frame (31) for mounting a switch (41) or the like on a panel (49), which comprises:

a decorative plate (36) formed with a through-hole (37) to be fitted into an upper sleeve portion (45) of the switch (41);

two suspending portions (32, 34) integrally formed with and vertically suspended from the lower end portion on both sides of the decorative plate (36) to clamp a main body portion (42) of the switch (41) therebetween, each suspending portion (32, 34) including a leg portion (32) in the form of a flat plate suspended from the decorative plate (36) and a pair of resilient plates (34) integrally formed with and upwardly extending from both lower end portions of the leg portion (32) to be resiliently deformable in the direction of width of the leg portion whereby the pair of resilient plates is fittable into a fitting hole of the panel (49);



engagement means (38, 38*a*, 38*b*, 38*c*) provided on each suspending portion for engaging with a corresponding engagement portion provided on the main body portion of the switch; and bridges 38 disposed transversely of said resilient plates 34 between the lower portions of said plates; said engagement means being provided on each of bridges (38) and being integrally formed with said leg portions.

4,434,340

SWITCH OPERATING MECHANISM

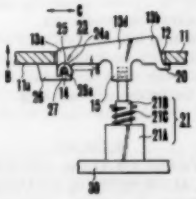
Masao Kondo, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Shizuoka, Japan

Filed Jul. 29, 1981, Ser. No. 288,194

Claims priority, application Japan, Aug. 13, 1980, 55-113765[U]

Int. Cl.³ H01H *3/04*

U.S. Cl. 200—332 **13 Claims**



1. A switch operating mechanism comprising:

a base plate provided with an opening;

an operating member pivotably accommodated in said opening;

a bearing member projecting from a portion of a bottom surface of a base plate near said opening and overlying said opening;

a pair of supporting members with grooves, said supporting members projecting in opposite directions from said operating member, the distance between outer surfaces of said supporting members being larger than the width of said opening;

a shaft member located between said bearing member and said bottom surface of said base plate and across said opening for rotatably engaging said grooves of said supporting members when said operating member is mounted; and

an actuator operated by said operating member for actuating a switch mounted on said base plate.

4,434,341

SELECTIVE, LOCALLY DEFINED HEATING OF A BODY

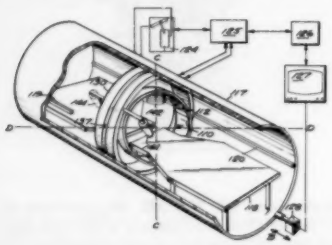
Dennis L. Busby, Papenbuderstr. 25, 2000 Hamburg 76, Fed. Rep. of Germany

Filed Dec. 11, 1980, Ser. No. 215,445

Claims priority, application Fed. Rep. of Germany, Feb. 20, 1980, 3006356; Aug. 11, 1980, 3030327

Int. Cl.³ H05B *6/72;* **A61N** *5/02*

U.S. Cl. 219—10.55 A **15 Claims**



1. Apparatus for the selective, locally defined heating of an object, comprising:

a ring;

a plurality of high-frequency radiation-emitting transmitters for heating an object upon which the radiation therefrom is directed;

means for mounting said transmitters to said ring so that radiation beams emitted by said transmitters intersect each other generally within a common volume generally encompassed by said ring;

a radially-extending electromagnetic coil surrounding at least one of said transmitters and comprising means for facilitating focusing of the radiation emitted by said at least one said transmitter;

means for mounting said ring so that it is pivotal about two perpendicular axes and is reciprocal along a dimension perpendicular to a plane containing said ring;

a plurality of ultrasonic generators;

means for mounting said ultrasonic generators on an inner-surface of said ring, each adjacent a transmitter; and

control means, responsive to signals from said ultrasonic generators, for positioning said ring.

4,434,342

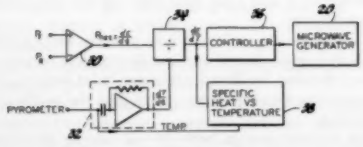
MICROWAVE HEATING CONTROL AND CALORIMETRIC ANALYSIS

Norman W. Schubring, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 11, 1982, Ser. No. 338,636

Int. Cl.³ H05B *6/68*

U.S. Cl. 219—10.55 M **3 Claims**



1. A method of controlling the input of microwave energy in heat processing of a material that is heatable with microwaves to produce therein a desired temperature response with time, comprising

subjecting a load of such material to microwave energy at a power level sufficient to commence heating the material while the material is situated in a cavity receptive to microwave radiation,

monitoring the temperature of the material as it is heated by said energy and continually producing an electrical signal indicative of such temperature,

monitoring the microwave power applied to the load and the power reflected from the load and continually producing an electrical signal indicative of the net power absorbed by the load,

continually producing an electrical signal indicative of the rate of change of said net applied power with the change of said temperature by continually using said temperature indicative signal and said net power indicative signal, and

employing said rate of change indicative signal in control of the microwave energy input to said load so as to produce therein said temperature response with time.

4,434,343

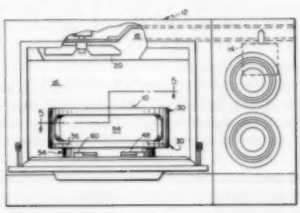
TURNTABLE FOR MICROWAVE OVEN

Robert F. Bowen, Burlington, and Thomas J. Martel, North Reading, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Jan. 15, 1982, Ser. No. 339,579

Int. Cl.³ H05B *6/80;* **A47B** *11/00*

U.S. Cl. 219—10.55 F **5 Claims**



1. A turntable adapted for being positioned in a microwave oven to provide substantially uniform food heating by rotation thereof, comprising:

a microwave transparent platform for supporting food, said platform having a shaft extending downwardly from the middle of the underside thereof;

means for rotating said platform about the axis of said shaft, said rotating means comprising a coil spring and a braking mechanism positioned in substantially the same horizontal plane thereby minimizing the vertical height of said rotating means;

means for shielding said rotating means from microwave energy, said shielding means comprising a metal pan having a metal cover with an aperture therein, said cover extending outwardly from the side wall of said pan to form a lip, said lip extending outwardly for a distance and then downwardly forming a channel to provide a low microwave field region between said side of said pan and the downward region of said lip, said lip further having an annular trough;

spherical bearings positioned in said trough;

an annular keeper positioned over said trough for maintaining substantially equal spacings between said bearings;

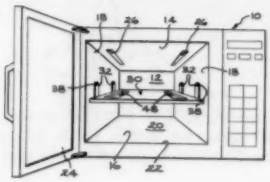
said platform being supported by said bearings; and

said shaft extending through said aperture for coupling to said rotating means.

4,434,344
SELF-STORING MEAL RACK FOR A MICROWAVE OVEN

Raymond L. Dills, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Aug. 12, 1982, Ser. No. 407,387
Int. Cl.³ H05B 6/80; F24C 15/16
U.S. Cl. 219—10.55 E **3 Claims**



1. A microwave oven having a bottom surface, a top surface having waveguide slots, rear walls, side walls, an access opening and an oven door hingedly mounted relative to said access opening between an open and closed position, a self-storing cooking rack comprising:

a food rack within said microwave oven;

arms on each side of said rack, each pivotally secured on one end to said rack and on the other end being pivotally secured to the side walls of said microwave oven for allowing movement of said rack between a lower cooking position wherein said rack is spaced from said bottom surface a distance sufficient to provide a cooking area between said rack and said bottom surface, and an upper storage position wherein said rack is positioned adjacent said top surface;

holding means including detent means on said arms dimensioned to engage a first cooperating detent means on said microwave oven side walls for holding said rack in said lower cooking position when said arms are rotated to a position below said side wall pivot and for engaging a second cooperating detent means on said microwave oven side walls for holding said rack in said upper storage position when said arms are rotated to a position above said side wall pivot;

said rack having apertures therein to permit unobstructed propagation of microwave energy to the lower portion of said cavity when said rack is in its upper storage position.

4,434,345
MICROWAVE SYSTEM FOR FROST PROTECTION OF FRUIT TREES

Ralph P. Muscatell, 2007 NE. 20th Ave., Fort Lauderdale, Fla. 33304

Filed Jul. 29, 1982, Ser. No. 403,063
Int. Cl.³ H05B 6/72
U.S. Cl. 219—10.55 R **13 Claims**

1. A microwave system for frost protection of fruit trees and plants comprising:

a source of microwave energy;

a directional, directable microwave antenna;

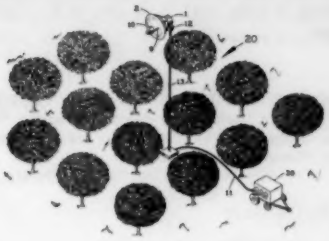
said source of microwave energy and said directional, directable microwave antenna physically forming a unitary assembly;

means for transmitting microwave energy from said source of microwave energy to said microwave antenna;

means for directing said directional, directable microwave antenna;

a source of primary energy;

means for conducting said primary energy to said source of microwave energy; and

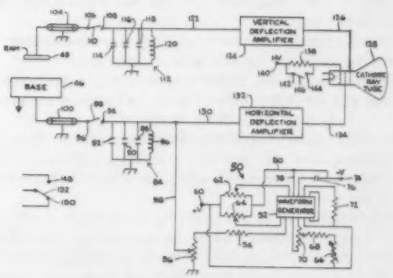


means for structural support of said directional, directable microwave antenna.

4,434,346
CONTACT DETECTOR

Roger J. Kern, c/o Kern Special Tools Co., Inc., 140 Glen St., New Britain, Conn. 06051

Continuation-in-part of Ser. No. 195,369, Oct. 9, 1980, abandoned. This application Aug. 2, 1982, Ser. No. 404,326
Int. Cl.³ B23P 1/02
U.S. Cl. 219—69 C **21 Claims**



1. Apparatus for detecting the point of contact between a workpiece element of electrically conductive material in a machine or measuring device and an electrically conductive element movable relative to and insulated from said workpiece and defining a gap when spaced from said workpiece comprising:

(a) means for generating a time-varying signal having a predetermined amplitude and frequency;

(b) means for applying said signal to one of the elements forming said gap;

(c) means connected to the other of said elements forming said gap for deriving a signal therefrom as a result of the flow of electrical current between said workpiece element and conductive element through said gap; and

(d) means connected to said signal generating means and to said signal deriving means for comparing said applied and derived signals as to amplitude and phase angle and for providing an indication of the comparison with the result that the combination of amplitude difference and a phase difference between said applied and derived signals can indicate the conditions of no contact, gap contamination, vibratory contact, or actual contact, respectively, between said conductive element and said workpiece element.

10. Apparatus according to claim **1**, wherein said machine is an electrical discharge machine wherein said conductive element is an electrode movable toward and away from said workpiece element and said workpiece is supported on an

electrically conductive base connected to earth ground, wherein said signal applying means is connected to said machine base, and wherein said apparatus is connected to an electrical ground which is floating with respect to earth ground.

4,434,347

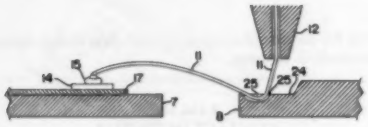
LEAD FRAME WIRE BONDING BY PREHEATING

John A. Kurtz, Gorham, and Donald E. Cousens, Saco, both of Me., assignors to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Filed Aug. 19, 1981, Ser. No. 294,411

Int. Cl.³ B23K *11/32*

U.S. Cl. 219—56.22 **38 Claims**



1. A method for welding bonding a lead wire or bonding wire held in the capillary bonding tool of a lead wire bonding machine to a die pad of an integrated circuit chip mounted on a lead frame and thereafter weld bonding said lead wire to a metal lead frame finger to provide an electrical lead wire coupling between the circuit chip die pad and the lead frame finger comprising:

defining a bonding zone for carrying out said method;

flooding said bonding zone with an inert gas;

ball bonding the end of said lead wire to a circuit chip die pad at a first temperature below the temperature level at which damage might occur to the circuit chip;

providing preheating electrode means separate from the bonding tool and positioning said preheating electrode means over the lead frame finger to which the lead wire is to be bonded;

preheating the lead frame finger to which the lead wire is to be bonded by application of electrical energy through said preheating electrode means while substantially isolating the lead frame finger from electrical or thermal coupling between the lead frame finger and circuit chip, and preheating said lead frame finger to a second temperature above the temperature level at which damage might occur to the circuit chip;

retracting said preheating electrode means and terminating application of electrical energy to said lead frame finger through the preheating electrode means prior to contact of the lead wire with said lead frame finger;

contacting the lead wire with the preheated lead frame finger and bonding a section of the lead wire to the preheated lead frame finger;

and serving said lead wire adjacent said bond at the lead frame finger.

4,434,348

CATHODIC CLEANING OF ALUMINUM TUBE

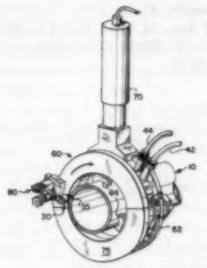
Gary L. Reid, Fletcher, Ohio, assignor to Hobart Brothers Company, Troy, Ohio

Filed Jan. 18, 1982, Ser. No. 339,927

Int. Cl.³ B23K *9/235*

U.S. Cl. 219—61 **6 Claims**

1. A process for cleaning the edge of a tube prior to welding comprising the steps of positioning an electrode adjacent the root face of the tube and substantially parallel to the longitudinal axis of the tube and causing relative movement between the tube and the electrode while applying direct current between the electrode and the tube such that the electrode is positive with respect to the tube to cause the entire root face of the tube along with a portion of both the inner and outer surfaces of the



tube adjacent the edge to be cathodically cleaned in a single operation.

4,434,349

LASER BEAM CUTTING MACHINES AND THE LIKE

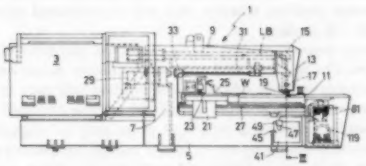
Akira Tsutsumi, La Mirada, Calif., assignor to Amada Engineering & Service Co., La Mirada, Calif.

Filed Feb. 4, 1982, Ser. No. 345,680

Claims priority, application Japan, Feb. 6, 1981, 56-14924[U]; Apr. 30, 1981, 56-64351

Int. Cl.³ B23K *27/00*

U.S. Cl. 219—121 LG **6 Claims**



1. Apparatus for cutting a workpiece with heat energy such as laser radiation comprising:

a first filter chamber in which a bucket and an air filter are provided beneath a working area,

a second filter chamber communicating with the first filter chamber, said second filter chamber being provided with a liquid filter and being communicated with a vacuum pump, and

means for introducing fumes into the liquid filter from the first filter chamber through the air filter.

4,434,350

METHOD OF AND DEVICE FOR MANUFACTURING AN INK JET PRINTER

Peter Flisikowski, Hamburg; Werner Jeglinski, Bönningstedt, both of Fed. Rep. of Germany, and Gerardus Jelmorini, Valkenswaard, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 8, 1982, Ser. No. 355,838

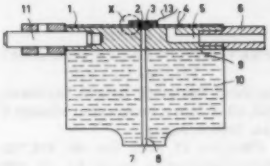
Claims priority, application Fed. Rep. of Germany, Apr. 2, 1981, 3113239

Int. Cl.³ B23K *27/00*

U.S. Cl. 219—121 LC **8 Claims**

1. A method of manufacturing an ink jet printer, comprising at least one jet nozzle whose pressure chamber is recessed in a body and is covered by a metal diaphragm on which there is arranged a drive element for the ejection of ink droplets from the jet nozzle, characterized in that the pressure chamber (2)

and a narrow passage (4) are formed in the body (9) by depression, the narrow passage (4) connecting the pressure chamber (2) to a supply duct (5) for ink, the metal diaphragm (1) being



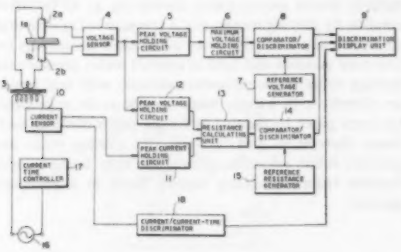
connected to the body (9) in a vacuumtight manner by energy beam welding for which purpose the energy beam is guided along the edges of the pressure chamber (2) and the narrow passage (4).

4,434,351

METHOD AND SYSTEM FOR DETERMINING WELD QUALITY IN RESISTANCE WELDING

Shuji Nakata, Toyonaka; Yoshio Kawaguchi, Yokohama, and Akira Nishimura, Yokosuka, all of Japan, assignors to Nissan Motor Company, Limited, Kanagawa, Japan

Filed Jun. 1, 1981, Ser. No. 268,887
Claims priority, application Japan, Jun. 2, 1980, 55-72830
Int. Cl.³ B23K *11/24*
U.S. Cl. 219—117.1 7 Claims



1. A method of determining weld quality in resistance welding independently of variations in current path geometry due to electrode tip deformation, which comprises the steps of:

(a) detecting a plurality of values of an electrode voltage applied to the welding electrodes between which the members to be welded are pinched;

(b) detecting a plurality of values of an electrode current flowing between the welding electrodes;

(c) calculating electrode resistance by dividing the electrode voltage by the electrode current;

(d) comparing the calculated electrode resistance immediately before the electrode current is cut off with a predetermined electrode resistance;

(e) comparing the maximum value among the detected electrode voltage values with a predetermined reference electrode voltage; and

(f) determining that the weld quality is acceptable when both the calculated electrode resistance and the detected maximum electrode voltage lie within the respective allowable ranges,

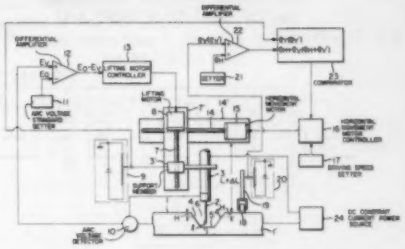
whereby the weld quality is determined independently of variations in current path geometry due to deformation or crushing of electrode tips.

4,434,352

ARC WELDING METHOD FOR AUTOMATICALLY REVERSING A WELDING TORCH IN THE WIDTH DIRECTION OF THE GROOVE AT A SET POSITION

Hirokazu Nomura; Yuji Sugitani, both of Tsu, and Yasuo Suzuki, Hisai, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed May 5, 1982, Ser. No. 375,202
Int. Cl.³ B23K *9/12*
U.S. Cl. 219—125.12 2 Claims



1. In an automatic arc-welding method, which comprises:

continuously moving a carriage along the longitudinal direction of a groove formed between objects of welding; fitting a welding torch to said carriage so that said torch is directed substantially vertically to said groove, said torch moving together with said carriage; directing a welding electrode through said torch toward said groove; feeding a welding current to said electrode to produce an arc between the tip of said electrode and said groove to weld said objects of welding together by means of the arc heat along said groove; continuously moving said torch, during travel of said carriage, in the width direction of said groove while continuing welding; continuously detecting a value (E_γ) of the arc voltage or arc current of said arc; continuously calculating a deviation (E_σ–E_γ) of the thus detected value (E_γ) from a previously set value (E_σ) of the arc voltage or arc current; continuously moving said torch vertically up and down, during travel of said carriage, so that said deviation (E_σ–E_γ) becomes null, thereby maintaining the distance between the tip of said electrode and said groove always at a prescribed distance (l) during the movement of said torch in the width direction of said groove; continuously detecting a vertical position of said torch as a value of voltage (e_γ) indicated by a potentiometer for each movement of said torch in the width direction of said groove; reversing the direction of movement of said torch in the width direction of said groove at the moment when said value of voltage (e_γ) thus detected agrees with a prescribed value of voltage; repeating said movement of said torch in the width direction of said groove, said movement of said torch in the vertical direction and said reversal of the direction of the movement of said torch in the width direction of said groove; on the other hand, continuously moving said torch in the longitudinal direction of said groove, while continuing welding, together with said carriage; thereby reciprocally moving said torch in the width direction of said groove following the face of said groove while maintaining the distance between the tip of said electrode and said groove always at said prescribed distance (l), and, at the same time, moving said torch in the longitudinal direction of said groove so as to weld said objects of welding in the longitudinal direction of said groove;

the improvement characterized by:

said prescribed value of voltage, for one movement of said torch in the width direction of said groove, for the purpose of reversing the direction of movement of said torch in the width direction of said groove being equal to a

value of the sum (e_H+e_V) of a previously set value of voltage (e_H) and a value of voltage (e_V) corresponding to a deviation (ΔL) of the distance between said carriage and said objects of welding from a previously set distance (L).

4,434,353

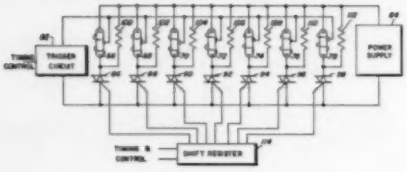
FUSING SYSTEM

Dana G. Marsh, Fairport; David R. Shuey, Webster, and John L. Webb, Fairport, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Sep. 30, 1981, Ser. No. 306,985

Int. Cl.³ G03G *15/20*; H05B *3/42*

U.S. Cl. 219—216 **8 Claims**



5. An electrophotographic printing machine of the type having a toner powder image formed on a copy sheet, wherein the improved apparatus for fusing the toner powder image to the copy sheet includes:

a plurality of heating elements; and

means, responsive to the size of the copy sheet, for energizing selected ones of said plurality of heating elements in an ordered sequence to produce a radiant energy output therefrom corresponding in surface area to substantially about the surface area of the copy sheet to heat the toner powder image on the copy sheet so as to permanently affix the toner powder image thereto.

4,434,354

THERMAL PRINTER

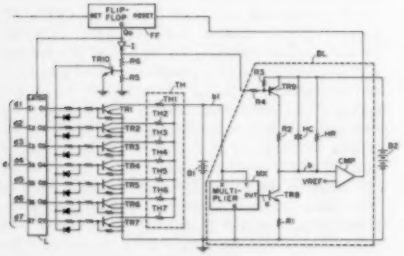
Shinichi Nakata, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 11, 1982, Ser. No. 338,378

Claims priority, application Japan, Feb. 3, 1981, 56-14521

Int. Cl.³ H05B *1/00*; G01D *15/10*

U.S. Cl. 219—216 **3 Claims**



1. A thermal printer comprising:

a thermal head having a plurality of heating elements;

a first power supply for energizing said heating elements of said thermal head;

a single capacitor for converting the temperature of said thermal head into an electrical signal;

a comparator for comparing said electrical signal from said single capacitor and a reference voltage applied thereto to produce an output signal in response to a variation in voltage of said first power supply; and

control means for controlling a time period of energizing all of said heating elements of said thermal head in response to the output signal from said comparator.

4,434,355

OFFSET PREVENTION LAYER FOR HEAT ROLLER FIXING DEVICE

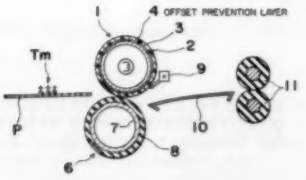
Sanji Inagaki; Shinji Takiguchi, both of Toyokawa, and Susumu Tanaka, Hoi, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jul. 15, 1982, Ser. No. 398,700

Claims priority, application Japan, Jul. 17, 1981, 56-112811; May 31, 1982, 57-93868

Int. Cl.³ B21B *27/00*; H05B *3/02*

U.S. Cl. 219—216 **7 Claims**



1. A heat roller fixing device for use in an electrophotographic copying apparatus and the like, which comprises a heating roller constituted by an offset prevention layer laminated on an electrically conductive core member and having heating means incorporated therein so as to be driven for rotation by driving means, and a pressure roller constituted by an electrically insulative layer on another electrically conductive core member and held in contact under pressure with the heating roller for simultaneous rotation with said heating roller, thereby to fix a toner image formed on the copy paper onto the copy paper by causing said copy paper carrying said toner image thereon to pass between said heating roller and said pressure roller, said offset prevention layer being composed of fluorine resin containing carbon fibers in a predetermined amount.

4,434,356

REGULATED CURRENT SOURCE FOR THERMAL PRINTHEAD

Timothy P. Craig, Georgetown; John W. Pettit, and Michael R. Timperman, both of Lexington, all of Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 22, 1982, Ser. No. 452,346

Int. Cl.³ B41J *3/20*

U.S. Cl. 219—216 **21 Claims**

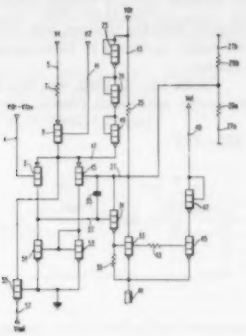
1. Constant-current drive circuitry comprising:

a voltage-regulator circuit responsive to a variable first voltage to produce a second voltage a fixed amount greater than said first voltage;

a variable-reference voltage circuit responsive to said second voltage to produce a third voltage a fixed amount less than said second voltage,

a current-drive circuit responsive to said second voltage and said third voltage, having a resistance element, and substantially isolating said third voltage from current produced in said current-drive circuit, said current drive circuit having a first point having a voltage set by said third voltage and having a second point having a voltage set by said second voltage, said first point and said second

point being electrically connected across said resistance element to produce a current, and means connecting said



current as a drive current to a third point connected to said first voltage.

4,434,357

APPARATUS FOR HEATING ELECTRICALLY CONDUCTIVE FLOWABLE MEDIA

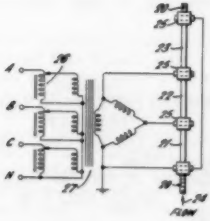
David P. Simpson, Chester, and Robert Stirling, Wirral, both of England, assignors to The Electricity Council, England

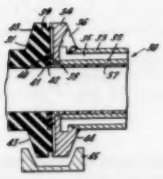
Filed Jan. 13, 1981, Ser. No. 224,855

Claims priority, application United Kingdom, Jan. 21, 1980, 8001996

Int. Cl.³ H05B *3/60*; A23L *3/32*

U.S. Cl. 219—291 **17 Claims**





1. Apparatus for heating an electrically conductive flowable medium, comprising pipe means through which the medium can be arranged to flow, the pipe means having an internal surface of a material having an electrical conductivity no greater than that of the medium, at least two electodes spaced apart along the pipe means and arranged to make electrical contact with medium flowing therethrough, supply means for applying an alternating electrical supply across said electrodes so that alternating current can flow in the medium between the electrodes to heat the medium, and means for cooling the internal wall surface of the pipe means so as to remove heat from the medium immediately adjacent said internal surface to prevent heating of the medium in a layer immediately adjacent said internal surface to such a temperature that the medium would foul the internal wall surface.

4,434,358

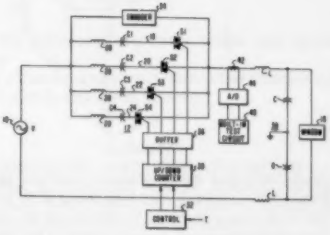
AIRCRAFT WINDOW HEAT CONTROLLER WITH SWITCHED IMPEDANCES

Otto L. Apfelbeck, Fort Shawnee, and Joseph M. Urish, Shawnee Township, Lima County, both of Ohio, assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 121,073, Feb. 13, 1980, abandoned. This application May 7, 1982, Ser. No. 376,072

Int. Cl.³ H05B *1/02*

U.S. Cl. 219—501 **5 Claims**



1. An electrical resistance heater controller, for controlling application of power from an AC source to a heating element, comprising:

a plurality of parallel circuit branches, each connected in series with an AC source and a heating element and each comprising a capacitor and gate-controlled solid state switching means in series with each other;

gating means for switching individual ones of said solid state switching means on and off in accordance with a heating element temperature signal so that a variable controlled amount of capacitance is in series between the source and the heating element to maintain the heating element temperature within a predetermined range, said gating means comprising means for switching said solid state switching means on and off substantially at the zero crossing of the AC source voltage waveform.

4,434,359

AUTOMATIC BANK NOTE TRANSACTION APPARATUS

Yoshihiro Watanabe, Fujisawa, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jul. 6, 1982, Ser. No. 395,311

Claims priority, application Japan, Jul. 10, 1981, 56-107683

Int. Cl.³ G06F *15/30*

U.S. Cl. 235—379 **5 Claims**

1. An automatic bank note transaction apparatus comprising:

a housing having a bank note dispensing port and a front door at a front side thereof and a rear door at a rear side thereof;

a first mechanism detachably mounted in said housing through said rear door; and

a second mechanism provided in said housing, adjacent to and detachably mounted on said first mechanism and connected to said bank note dispensing port,

said first mechanism including:

safe means disposed at one side of the first mechanism for taking out the bank notes therefrom;

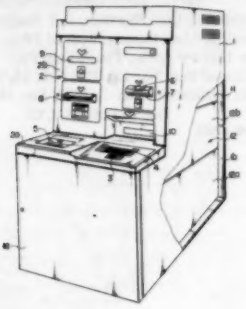
transferring means for transferring the bank notes taken out of said safe means; and

first conveying means disposed between said safe means and said transferring means for transferring the bank notes taken out of said safe means to said transferring means,

said first mechanism being reversible relative to the second mechanism between a first position at which said safe means is near said rear door and a second position at which said safe means is near said front door, and

said second mechanism including:

receiving means, opposing said transferring means, for receiving the bank notes from said transferring means; and



second conveying means disposed between said receiving means and said bank note dispensing port, for conveying the bank notes received in the receiving means to said bank note dispensing port, whereby at the first position a maintenance operation for the safe means is performed in a condition where the rear door is opened, and at the second position the maintenance operation is performed in a condition where the front door is opened.

4,434,360

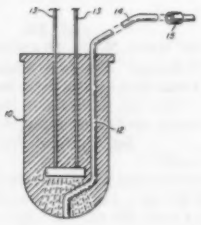
OPTICAL SENSING DEVICE FOR READING BAR CODE OR THE LIKE

Alan H. Woosley, Lubbock, and Billy R. Masten, Shallowater, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 287,838, Jul. 29, 1981, abandoned. This application Sep. 15, 1983, Ser. No. 532,815

Int. Cl.³ G06K *7/10*

U.S. Cl. 235—472 **5 Claims**



1. An optical sensing device for reading data codes, comprising:

a light source affixed within a transparent or translucent package;

a single strand of optical fiber material having a diameter substantially equal to the minimum width of the bars contained in the desired bar code, wherein said package comprises a solid plastic body having a flat end and a rounded end, and wherein said fiber optic strand extends through at least a portion of said body such that one end of said strand is flush with and imbedded in said rounded end of said body to receive light reflected from said codes.

4,434,361

TRANSISTOR INTEGRATED CIRCUIT PROTECTED AGAINST THE ANALYSIS, AND A CARD COMPRISING SUCH A CIRCUIT

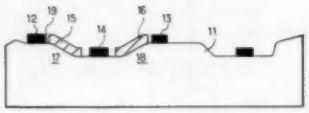
Alain Meinguss, Meudon la Foret, and Bernard Despres, Paris, both of France, assignors to Electronique Marcel Dassault, Paris, France

Filed Dec. 1, 1980, Ser. No. 211,968

Claims priority, application France, Nov. 30, 1979, 7929590

Int. Cl.³ G06K *7/06*

U.S. Cl. 235—192 **4 Claims**



1. A transistor integrated circuit having a substrate with at least one integrated transistor formed in said substrate and a plurality of connections to said transistor comprising:

a conduction element on the surface of said substrate connected to an electrode of said transistor, and

a metallic zone on or beneath said surface, electrically isolated from said transistor, said metallic zone positioned with respect to said transistor to make analyses of integrated circuit connections difficult.

4,434,362

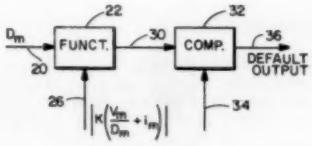
DISPLACEMENT DEPENDENT LOW CONTRAST DEFAULT

Dennis J. Wilwerding, Littleton, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 14, 1981, Ser. No. 311,124

Int. Cl.³ G01J *1/20*

U.S. Cl. 250—201 **28 Claims**



1. Apparatus for producing a low contrast default signal for an auto focus system which system produces a first signal which varies with contrast conditions and a second signal which varies with out-of-focus conditions comprising:

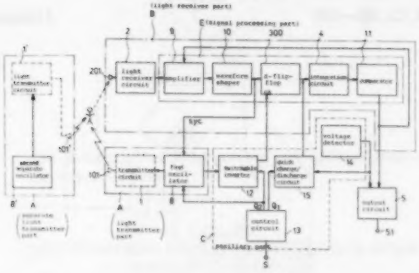
first means producing a third signal of predetermined magnitude;

signal processing means connected to receive the first, second and third signals, the signal processing means operably to modify one of the first and third signals in accordance with the second signal to produce a fourth signal which varies with the second signal and to compare the fourth signal with the other of the first and third signals to produce the low contrast default signal.

4,434,363
PHOTOELECTRIC SWITCHING APPARATUS

Yuki Yorifuji, Hirakata; Seiichi Uyama, Katano; Katsuhiko Fukutake, Matsuzaka, and Masaharu Miyazaki, Mie, all of Japan, assignors to Matsushita Electric Works, Ltd., Kadoma, Japan

Filed May 11, 1981, Ser. No. 262,772
Int. Cl.³ H01J 40/14
U.S. Cl. 250—214 B 6 Claims



1. A photoelectric switching apparatus comprising:

a light transmitter part comprising a first built in oscillator and a detachable light transmitter circuit which is driven by said first oscillator when said light transmitter is connected to said first oscillator and a detachable light emitter for emitting light in response to signal received from said light transmitter circuit,

a light receiver part comprising at least a photoelectric transducer for converting a light signal incident thereon to a converted electric signal and a signal processing part for processing the signal based on said converted electric signal,

an auxiliary part for controlling operation of said light transmitter part and said light receiver part,

a second oscillator which is separate from said light transmitter part and can be connected to said light transmitter circuit when said light transmitter circuit and said light emitter together are detached from said first oscillator,

said signal processing circuit comprising a d-flip-flop which reads input data based on said converted electric signal by utilizing an output signal of said first oscillator as its clock pulse, received through a switchable inverter,

said first oscillator issuing an output signal which is substantially synchronous with said converted electric signal to said d-flip-flop by utilizing a signal based on said converted electric signal when said light transmitter circuit and said light emitter are detached from said first oscillator, and

said first oscillator issuing an output signal which drives said light transmitter circuit, to said d-flip-flop when said light transmitter is connected to said first oscillator.

4,434,364
METHOD AND APPARATUS FOR UNDERWATER DETECTION OF HYDROCARBONS

Aderbal C. Correa; John S. Gergely, both of Ponca City, Okla., and Andrew J. Blanchard, College Station, Tex., assignors to Conoco Inc., Ponca City, Okla.

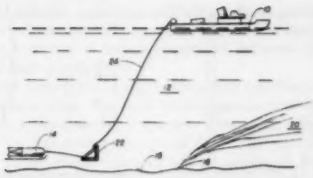
Division of Ser. No. 216,137, Dec. 15, 1980, Pat. No. 4,394,573. This application Jan. 3, 1982, Ser. No. 454,959
Int. Cl.³ G01V 5/00
U.S. Cl. 250—253 7 Claims

1. A method for detecting presence of hydrocarbons within a body of water comprising:

moving an instrument platform through said body of water at a preselected distance above the water bottom;

generating light energy and directing said light energy from said instrument platform toward a selected area within the body of water;

detecting the backscattered light energy at said selected area within a defined spatial resolution cell in the body of water;



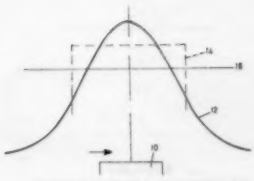
deriving the differential absorption within said resolution cell; and

providing a data readout of said differential absorption as an indication of hydrocarbon presence.

4,434,365
RADIOMETRIC METHODS AND MEANS

Rolf C. Bohme, Kyalami, and Max M. Lazerson, Northcliff, both of South Africa, assignors to General Mining Union Corporation Limited, Johannesburg, South Africa

Filed Nov. 28, 1980, Ser. No. 211,098
Claims priority, application South Africa, Dec. 21, 1979, 79/6989; Jul. 15, 1980, 80/4251
Int. Cl.³ G01V 5/00; G01N 23/00; G21C 11/00
U.S. Cl. 250—255 15 Claims



1. A method of measuring radio-active emissions from moving radio-active material including the steps of locating a radiation detector having a receptor surface adjacent to the path of the material, shielding the detector by locating a first radiation shield of a first material around at least a portion of the detector leaving the receptor surface of the detector unshielded, further shielding the shielded portion of the detector by locating a second radiation shield of a second material which is inherently less radiation emissive than the material of the first shield between at least a portion of the material of the first shield and the detector, the first and second shields being effective as radiation shields against the same type of radiation, moving the material to be measured for radio-active emissions past the unshielded receptor surface of the detector and measuring the emissions from the material by means connected to the detector.

4,434,366
APPARATUS FOR MEASURING COATING THICKNESS

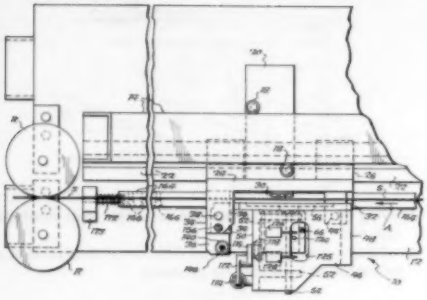
Jerry J. Spongr, Tonawanda; John E. Tiebor, Williamsville, and Boris N. Ivasyuk, Tonawanda, all of N.Y., assignors to Twin City International, Inc., Amherst, N.Y.

Filed Aug. 9, 1982, Ser. No. 406,358
Int. Cl.³ G01N 23/00
U.S. Cl. 250—308 22 Claims

1. Apparatus for measuring coating thicknesses on selected areas of a strip-type material of a step and repeat coating sys-

tem having a dwell period and a motion period the apparatus comprising:

a thickness measuring probe supported for movement at least along a translational axis to a measuring position with respect to the strip-type material during the dwell period of the coating system and movable away therefrom to a



second position during the motion period of the coating system;

means responsive to a dwell period signal for moving said probe to said measuring position; and

said probe is normally contrained against movement parallel to the axis of movement of the strip-type material.

4,434,367

ELECTRON MICROSCOPE

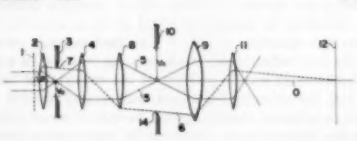
Akira Yonezawa, Fussa, Japan, assignor to International Precision Incorporated, Tokyo, Japan

Filed Jul. 28, 1981, Ser. No. 287,788

Claims priority, application Japan, Jul. 28, 1980, 55-102352

Int. Cl.³ H01J *37/09, 37/26*

U.S. Cl. 250—311 **4 Claims**



1. An electron microscope comprising an objective lens, at least one intermediate lens disposed backward of said objective lens, a projector lens disposed backward of said intermediate lens, and a movable aperture element disposed at a selected position between a principal plane of the intermediate lens located closest to said objective lens and a principal plane of said projector lens, wherein a first crossover is produced at the back focal plane of the objective lens, and the electron beam diverging from said first crossover is again focused at a plane of said movable aperture element to produce a second crossover by setting magnetic excitation of said intermediate lens at an appropriate level, to thereby restrict the divergence angle of the electron beam scattered by a specimen.

4,434,368

METHOD OF MEASURING THE REDUCING POWER OF GASES OVER THE CHARGE IN A BLAST FURNACE

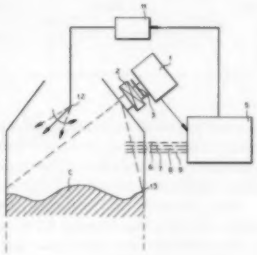
Jean Liesch, Esch; Nico Reiff, Luxembourg; Vlasta Reimen, Esch; Romain Schmit, Esch; Arthur Schummer, Esch; Jo Simon, Esch, and Paul Tonteling, Esch, all of Luxembourg, assignors to ARBED, S.A., Luxembourg, Luxembourg

Filed Dec. 22, 1981, Ser. No. 333,260

Claims priority, application Luxembourg, Dec. 24, 1980, 83 035

Int. Cl.³ C21B *7/24*

U.S. Cl. 250—339 **3 Claims**



1. A method of determining the reducing power of gases liberated at the top of the charge of an industrial furnace, said method comprising the steps of:

continuously scanning over a multiplicity of detection points distributed over the entire upper surface of said charge energy radiated in a wavelength range of 1 to 6 microns by excited molecules of the compounds CO_2, CO, H_2, and CH_4, and forming outputs corresponding to the energy radiated at each of said points by said compounds;

forming from said outputs an energy image of the energy radiated at said points in said range;

converting said energy image into respective specific images for said compounds by isolating from said energy image for each detection point a particular radiant energy emitted in said range by the respective compound;

calculating the concentration of each of said compounds at each of said points from the intensity of the respective specific image; and

deriving the reducing power at each of said detection points from the respective concentrations of said compounds thereat.

4,434,369

RADIOGRAPHIC CAMERA

Israel Metal, New York, N.Y., assignor to Raytheon Company, Lexington, Mass.

Filed Jan. 2, 1981, Ser. No. 222,182

Int. Cl.³ G01T *1/20*

U.S. Cl. 250—363 S **4 Claims**

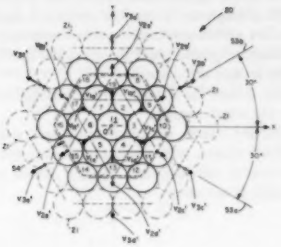
1. A radiographic camera, comprising:

(a) a scintillator;

(b) a plurality of photodetector means disposed at different, progressively increasing, predetermined distances from a reference point on the scintillator to a distal point adjacent the outer periphery of a nominal field of view of the camera, each one of such plurality of photodetector means producing a position signal representative of the distance between a point of impingement of radiation on the scintillator and such one of the photodetector means;

(c) means, responsive to the position signals, for producing an extrapolated correction signal representative of the distance between the point of impingement and a point further than the distal point and beyond the nominal field of view of the camera; and

(d) means, responsive to the position signals and the correction signal, for producing a pair of location signals indica-



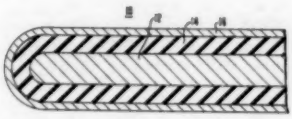
tive of the position of the point of impingement relative to the reference point.

4,434,370

SELF-POWERED RADIATION DETECTOR WITH IMPROVED EMITTER

Norman P. Goldstein, Murrysville, Pa., and William H. Todt, Elmira Heights, N.Y., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 4, 1980, Ser. No. 213,691
Int. Cl.³ G01T 1/22
U.S. Cl. 250—370 3 Claims



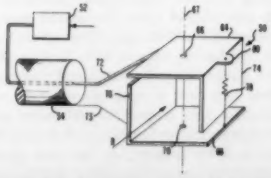
1. A gamma responsive self-powered radiation detector which comprises an elongated center wire emitter, insulating means about the emitter wire, and a collector electrode coaxial about the emitter and insulating means, which emitter wire is an alloy of lead as the major constituent with a sufficient atom percent addition of one of the group of aluminum, copper, nickel, platinum, or zinc so as to form an alloy with a melting point significantly greater than that of lead, which alloy retains the superior gamma response, high density and ductility of the lead major constituent.

4,434,371

ELECTRON BEAM BLANKING APPARATUS AND METHOD

Wolfgang Knauer, Malibu, Calif., assignor to Hughes Aircraft Company, El Segundo, Calif.

Filed Mar. 4, 1982, Ser. No. 354,846
Int. Cl.³ G21K 1/08
U.S. Cl. 250—396 R 12 Claims



1. A beam deflection apparatus for deflecting a charged particle beam as the beam moves along a beam path, said apparatus comprising:

upper and lower conductors respectively positioned along the beam path with respect to the travel of particles along the beam path, said upper and lower conductors each being configured and positioned to pass the charged particle beam along its path;

first and second capacitive deflection plates positioned respectively on laterally opposite sides of the beam path;

resistive connection means connected between said upper and lower conductors;

said upper conductor being connected to said first capacitive deflection plate and said lower conductor being connected to said second capacitive deflection plate; and

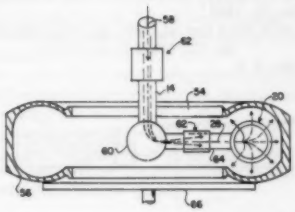
means for connecting electrical deflection energy to said upper and lower conductors for causing a continuous circuit through said upper and lower conductors and said resistive connection means for providing magnetic deflection of the charged particle beam and for charging up said first and second capacitive deflection plates for electrostatic deflection of the charged particle beam.

4,434,372

METHOD AND APPARATUS FOR WIDE ANGLE BEAM SCANNING TO INTERNALLY IRRADIATE HOLLOW OBJECTS

Marshall Cleland, Huntington Station, N.Y., assignor to Radiation Dynamics, Inc., Melville, N.Y.

Filed Jan. 20, 1982, Ser. No. 340,915
Int. Cl.³ G01K 1/08; H01J 3/14
U.S. Cl. 250—400 20 Claims



1. Wide angle beam scanning apparatus for internally irradiating hollow objects with a beam of charged particles comprising

particle accelerator means for producing a beam of charged particles; and

scanning deflection means configured to be disposed within an object to be irradiated for receiving said beam along a beam axis and deflecting said beam from said beam axis to scan said beam through an angle of deflection greater than 90° from said axis whereby the inner surface of the object can be irradiated with charged particles.

4,434,373

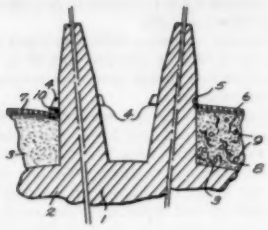
NEUTRON SHIELDING

Richard Christ, August-Bebel-Strasse 20, 6454 Bruchköbel, Fed. Rep. of Germany, and Hartmut Kroll, Gaussstrasse 6, 6450 Hanau, Fed. Rep. of Germany

Continuation of Ser. No. 206,675, Nov. 13, 1980, abandoned. This application Sep. 30, 1982, Ser. No. 431,100
Claims priority, application Fed. Rep. of Germany, Nov. 17, 1979, 7932528[U]
Int. Cl.³ G21F 5/00
U.S. Cl. 250—506.1 7 Claims

1. A container suitable for the conveyance and/or storage or radioactive materials which produce gamma and neutron radiation emissions and noteworthy residual heat, said container comprising, in combination, a container body having shielding

means for gamma-radiation, bar-shaped cooling fins extending from the exterior surface of said container, at least some of said cooling fins having bosses extending from the sides thereof and



neutron shielding means in the form of resilient elastic molded bodies, with a said body removably disposed between an adjacent pair of cooling fins and removably held in place by said bosses on the exterior of said container.

4,434,374

DEVICE FOR GENERATING ELECTRICITY BY PEDESTRIAN AND VEHICULAR TRAFFIC

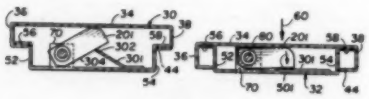
Roy L. Lundgren, 1360 NE. 48 Ct., Ft. Lauderdale, Fla. 33334

PCT No. PCT/US81/01235, § 371 Date Sep. 14, 1981, § 102(e) Date Sep. 14, 1981, PCT Pub. No. WO83/01158, PCT Pub. Date Mar. 31, 1983

PCT Filed Sep. 14, 1981, Ser. No. 309,276

Int. Cl.³ F04B *9/14, 35/06*

U.S. Cl. 290—1 R **3 Claims**



1. A device for generating electricity by utilizing the weight of pedestrian and vehicular traffic flow and to recoup energy from the traffic flow comprising:

a base having a generally channel-formed member defining a base web and spaced upstanding walls of equal height each terminating at outwardly directed flanges and a frame portion extending outwardly from said spaced upstanding walls;

a plurality of spaced apart, parallel support means formed from and integral with said base web and perpendicular thereto, each said support means having an aperture therein, said apertures in coaxial alignment;

a shaft means for transmitting torque rotatably mounted in said apertures;

a tread plate having at least a first and a second angled member, each angled member having a downwardly extending portion and a horizontally extending portion, said horizontally extending portions being in overlapping relation with respect to one another, said first and second angled members operably connected to said frame portion;

said tread plate operably engaged with said base for relative vertical movement therebetween;

rocker arm means in tangential engagement with said tread plate for following movement of said tread plate;

biasing means for biasing said rocker arm means upwardly into engagement with said tread plate, said biasing means connected to said base web;

one-way clutch means for movably connecting said rocker arm means to said shaft means, said clutch means engaging said shaft means upon downward movement of said rocker arm means causing rotation of said shaft means and disengaging said shaft means upon upward movement of said rocker arm means;

energy means for storing or converting mechanical energy to electrical energy;

connecting means for connecting said shaft means to said energy means, said connecting means storing energy insufficient to activate said energy means until said energy means is activated.

4,434,375

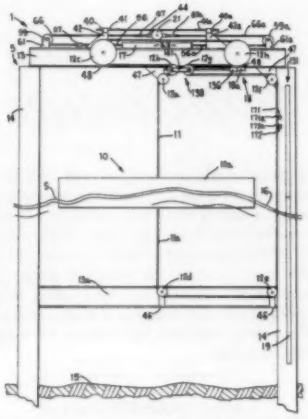
WAVE ENERGY CONVERTER

Robert N. Taylor, 211 Chapel Hill Dr., Battle Creek, Mich. 49015

Filed Jun. 30, 1982, Ser. No. 393,853

Int. Cl.³ F03B *13/12*

U.S. Cl. 290—53 **9 Claims**



1. A wave energy converter for harnessing energy from waves on the surface of a body of water, comprising:

a frame fixed on and upstanding from the bottom of the body of water;

a weighted float located to ride up and down with said waves adjacent said frame;

a load at least in part mounted on said frame;

means defining a closed loop connection between said float and load, said closed loop connection including alternately tensionable cables extending up and down from said float and having remote ends fixed with respect to said frame, guide pulley means on said frame guiding said cables from said float to said remote ends, and traveler means movable with respect to said frame and carrying direction change pulleys bending both said cables adjacent their fixed ends for multiplying the force applied to said traveler means by said cables, said load being connected to said traveler means for actuation thereby.

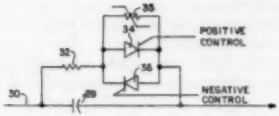
4,434,376
METHOD AND MEANS FOR DAMPING SUBSYNCHRONOUS OSCILLATIONS AND DC OFFSET IN AN AC POWER SYSTEM

Narain G. Hingorani, Los Altos Hills, Calif., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Division of Ser. No. 59,994, Jul. 23, 1979, Pat. No. 4,292,545, and a continuation-in-part of Ser. No. 30,691, Apr. 16, 1979, abandoned. This application Apr. 13, 1981, Ser. No. 253,688

Int. Cl.³ G05F *1/12*

U.S. Cl. 307—102 **12 Claims**



1. The method of damping subsynchronous oscillations and DC offset in an AC power system comprising the steps of

measuring the half-cycle time period of line waves in said power system,

comparing said measured half-cycle to a desired half-cycle time period, and

dissipating said line waves in resistine means in measured half-cycles which are longer than said desired half-cycle time period to the extent said measured half-cycles exceed said desired half-cycle time period.

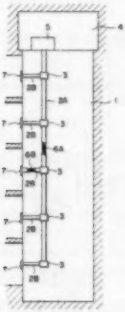
4,434,377
ELECTRIC POWER-FEEDING STRUCTURE

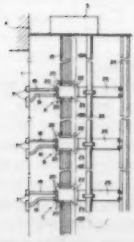
Eiji Shima, Oota; Hiroshi Den, Yotsukaido, and Takeo Kuroki, Funabashi, all of Japan, assignors to FEPS International, Ltd. and The Fujikura Cable Works, Ltd., both of Tokyo, Japan

Filed Jun. 16, 1982, Ser. No. 389,088

Int. Cl.³ H05K *7/06*; H02B *1/08*

U.S. Cl. 307—147 **9 Claims**





1. An electric power-feeding structure for use in a fixed power-feeding system for operation of an electrically powered elevator in which an electric power is fed from an electric power-supply terminal to electric power-receiving portions located at different floors through a main feeder line and, in turn, through branch feeder lines branched from the main feeder line, comprising:

(a) a main feeder assembly connected to an electric power supply-terminal,

said main feeder assembly comprising a plurality of main line sections successively arranged vertically and a plurality of junction means respectively interposed between respective mutually adjacent main line sections and connecting the respective mutually adjacent main line sections therethrough;

said plurality of main line sections each comprising at least one flat type cable which comprises an outer jacket and a plurality of insulated core conductors arranged in parallel in a substantially coplanar relationship and covered by said outer jacket, said plurality of insulated core conductors each comprising a plurality of element conductors covered by a sheath of an insulating material;

said at least one flat type cable having at least one end provided with a flat connector means electrically connected thereto;

said flat connector means having electric connector portions which are arranged in a row,

said plurality of junction means each comprising at least one printed circuit board having, on at least one surface thereof, a predetermined pattern circuit,

said at least one printed circuit board having a first connecting portion for detachably connecting thereto the flat connector means of the flat type cable of a main line section and a second connecting portion for detachably connecting thereto the flat connector means of the flat type cable of an adjacent main line section to said main line section;

said first connecting portion being electrically connected to said second connecting portion through said predetermined pattern circuit;

said at least one printed circuit board having at least one third connecting portion being electrically connected to said first and second connecting portions through said predetermined pattern circuit;

and

(b) a plurality of branch feeder lines respectively connected to a plurality of electric power-receiving portions located at different floors,

said plurality of electric power-receiving portions each comprising at least one terminal equipment;

each branch feeder line comprising at least one feeder cable;

said at least one feeder cable having its one end connected to said at least one terminal equipment and having the other end provided with a flat connector means electrically connected thereto;

said flat connecting means to the other end of the feeder cable being detachably connected to the third connecting portion of the printed circuit board.

4,434,378
D.C. POWER MONITOR

Howard K. Ballentine, Jr., Clearwater, Fla., assignor to Paradyne Corporation, Largo, Fla.

Filed Nov. 6, 1981, Ser. No. 318,742

Int. Cl.³ H03K *5/153*; G01R *17/02, 19/165*

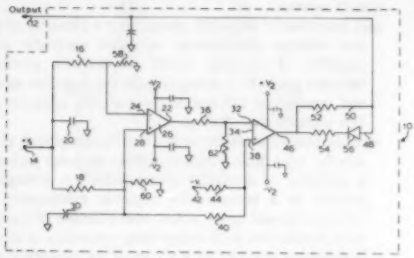
U.S. Cl. 307—350 **4 Claims**

1. A circuit for monitoring a D.C. voltage level and for generating a signal in the event said voltage falls below a desired level by a predetermined percentage comprising:

a two leg resistive network comprised of voltage dividers in each leg and connected at a juncture with a tap for the voltage to be monitored, the ratio of resistance values of

said network legs being equal to said predetermined percentage;

a first comparator having a first input tap connected to the higher resistance value leg of said resistive network, a second input tap connected to the other leg of said resistive network and an output tap;



a second comparator having a first input tap connected to the output of the first comparator, a second input tap, and an output tap at which said signal appears; and,

a capacitive element connected to the other leg of said resistive network and said second input tap.

4,434,379

INVERTER USING LOW-THRESHOLD-VOLTAGE FIELD-EFFECT TRANSISTORS AND A SWITCHING DIODE, FORMED AS AN INTEGRATED CIRCUIT

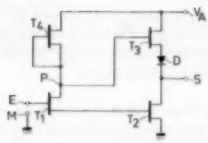
Georges Bert, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Mar. 18, 1981, Ser. No. 244,873

Claims priority, application France, Mar. 21, 1980, 80 06402

Int. Cl.[3] **H03K** *19/003, 19/094, 19/20*

U.S. Cl. 307—448 **4 Claims**



1. A logic inverter, formed as an integrated circuit using normally-off field effect transistors, comprising:

a first transistor whose gate forms an input terminal of said inverter, and whose drain is connected to a single polarity power supply through a saturable load; and

at least a second transistor whose gate is connected directly to the source of said first transistor, whose source is connected directly to the ground and whose drain forms an output terminal of said inverter, wherein the voltage V_{GS} of the diode gate/source of the second transistor is sufficient to pinch off the first transistor when the input is in logic condition "0", at low potential.

4,434,380

COMPENSATION FOR VCA OP AMP ERRORS

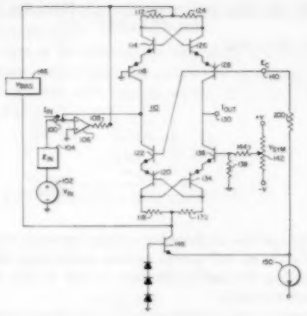
David R. Welland, Boston, Mass., assignor to dbx, Inc., Newton, Mass.

Filed Oct. 30, 1981, Ser. No. 316,754

Int. Cl.[3] **G06G** *7/26, 7/24*

U.S. Cl. 307—491 **7 Claims**

1. A multiplier circuit of the type comprising (1) an input amplifier, said amplifier providing a finite signal gain and having (a) an input terminal for receiving an input signal and (b) an output terminal and (2) a gain cell connected to the output of said amplifier, said gain cell including (A) means for generating a first signal in response to and as a logarithmic function of said input signal (B) means for algebraically adding a control signal to said first signal, and (C) means for generating a second signal as an antilogarithmic function of the algebraic sum of the first and control signals, wherein the improvement comprises:



means for generating a correcting signal in response to and as a function of the control signal at the output terminal of said input amplifier substantially equal and opposite to signals generated at the output of said amplifier in response to changes in said control signal.

4,434,381

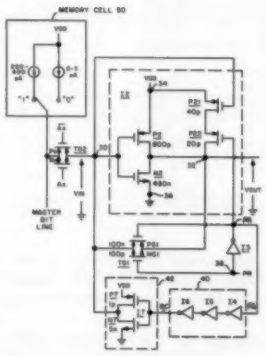
SENSE AMPLIFIERS

Roger G. Stewart, Neshanic Station, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 7, 1981, Ser. No. 328,437

Int. Cl.[3] **H03K** *5/153, 3/356;* **G11C** *7/06*

U.S. Cl. 307—530 **9 Claims**



1. A sense amplifier comprising:

means for supplying recurring precharge pulses;

an inverter having a signal input terminal, a signal output terminal, and first and second power terminals for receiving an operating potential therebetween, said inverter exhibiting a voltage transition point having a value between first and second voltage levels which represent first and second logic conditions, said output signal terminal of said inverter being driven toward said first or said second voltage levels dependent on whether a particular voltage being applied to its signal input terminal is above or below said voltage transition point;

said inverter including means coupled between said signal output terminal and one of said first and second power terminals responsive to each precharge pulse for shifting the voltage level at the output of said inverter at the termination of said precharge pulse;

selectively enabled feedback means responsive to each precharge pulse for completing a feedback connection from the output signal terminal of said inverter to its input signal terminal only for the duration of each precharge pulse;

selectively enabled bias means responsive to each precharge pulse for applying an offset current for a predetermined period of time, independent of the precharge period, to the signal input terminal of said inverter in a sense such that the voltage at the input signal terminal of said inverter is driven to a value offset from said particular voltage in a sense to predispose the output signal terminal of said inverter to assume said first voltage level at the conclusion of each precharge pulse; and

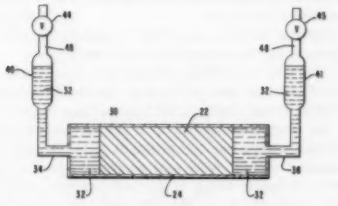
means for selectively applying signals to be sensed to the input signal terminal of said inverter, at selected times, each of which times follows the inception of a precharge pulse.

4,434,382

VISCOELASTIC SUPPORT FOR DYNAMOELECTRIC MACHINES

Mukunk R. Patel, Monroeville, and Richard D. Nathenson, Pittsburgh, both of Pa., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Jan. 18, 1982, Ser. No. 340,433
Int. Cl.³ H02K *5/24*
U.S. Cl. 310—51 **5 Claims**



1. A dynamoelectric machine, comprising:

a cylindrical rotor member;

a generally cylindrical association of stator coils disposed within a generally cylindrical coil support structure, said coil support structure being generally cylindrical with a central bore therethrough, said coil support structure being disposed in concentric and coaxial relation around said rotor member;

an outer structure having a central cylindrical bore therethrough, said outer structure being disposed around said coil support structure in concentric and coaxial relation therewith, said outer structure having an inner diameter surface shaped to receive said coil support structure with a generally cylindrical gap therebetween;

said inner diametric surface having a first channel shaped to receive a preselected portion of an interface assembly;

said coil support structure having an outer diametric surface which has a second chan..el shaped to receive a preselected portion of said interface assembly; and

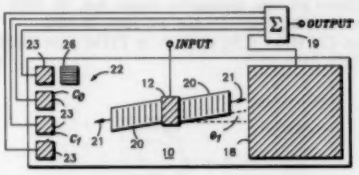
said interface assembly having a porous member impregnated with a liquid, said porous member being disposed within a generally flexible impermeable covering, a preselected portion of said interface assembly being disposed in said first channel and a preselected portion of said interface assembly being disposed in said second channel.

4,434,383

TEMPERATURE STABLE SURFACE ACOUSTIC WAVE DEVICE

Frederick Y. Cho, Scottsdale, Ariz., and Dylan F. Williams, Berkeley, Calif., assignors to Motorola Inc., Schaumburg, Ill.

Continuation-in-part of Ser. No. 232,611, Feb. 9, 1981. This application Jan. 10, 1983, Ser. No. 457,081
Int. Cl.³ H01L *41/08*
U.S. Cl. 310—313 R **9 Claims**



1. A temperature stable SAW device comprising:

a substrate having a known power flow angle variation as a function of temperature;

first means for generating surface acoustic waves on a surface of said substrate in response to a first electrical signal; and

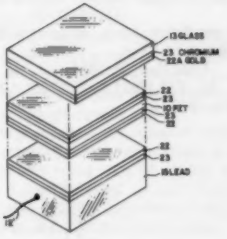
second means for generating at least one responsive electrical signal in response to said surface acoustic waves, said second means having a geometry such that said power flow angle variation provides compensation for temperature dependent changes in said substrate.

4,434,384

ULTRASONIC TRANSDUCER AND ITS METHOD OF MANUFACTURE

Clarence J. Dunnrowicz, Los Angeles, Calif., and Joseph Calerame, Lexington, Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Dec. 8, 1980, Ser. No. 214,534
Int. Cl.³ H04R *17/00*
U.S. Cl. 310—325 **13 Claims**



1. A transducer comprising:

an impedance matching layer;

a piezoelectric layer;

each layer having a surface with smooth and clean first composite gold film attached thereto;

said layers being in surface contact with each other and being gold bonded to each other at their interface by said gold films;

the gold film of each of said layers being sufficiently smooth and clean to produce said gold to gold bond after the application of low pressure on said layers forcing the gold films in contact with one another;

a support layer of acoustically absorptive material whose impedance matches that of said piezoelectric layer, said

support layer having a surface bonded to the other surface of said piezoelectric layer.

4,434,385

DISCHARGE LAMP DEVICE

Makoto Touho, Yawata; Shigeaki Wada, Osaka, and Minoru Yamamoto, Neyagawa, all of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Jun. 23, 1981, Ser. No. 276,455

Claims priority, application Japan, Jun. 30, 1980, 55-89391; Jun. 30, 1980, 55-89395; Jan. 17, 1981, 56-5430

Int. Cl.³ H01J *1/50;* **F21V** *9/16;* **F21M** *3/14;* **H01R** *39/00*

U.S. Cl. 313—161 **31 Claims**

1. A discharge lamp device including a lamp mounted to a socket means and having a coating of fluorescent material on the inside surface, said device comprising means for biasing a discharging zone generated inside said lamp to an area of a certain angle of rotation about the axis of the lamp, and means for shifting said biased discharging zone in circumferential directions with respect to the lamp axis, said biasing means comprising a magnetic field applied from the exterior to said lamp for rendering the magnitude of magnetism to be nonuniform in the section of the lamp, said biasing means further comprising a space separator disposed inside said lamp.

4,434,386

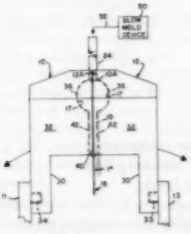
PROCESS AND APPARATUS FOR FORMING LAMP CAPSULES

Gary E. Lowe, Salem, Mass., assignor to GTE Products Corporation, Stamford, Conn.

Filed Dec. 28, 1981, Ser. No. 334,785

Int. Cl.³ H01J *9/00;* **C03B** *9/00, 11/00*

U.S. Cl. 313—331 **12 Claims**



9. A lamp capsule comprising:

a glass bulb having press seal at one end, and a lead assembly sealed through said press seal, said bulb and press seal being formed from a hollow glass blank by;

applying heat to the glass bulb so that it is in a molten state;

inserting the lead assembly into the glass blank at one end thereof;

press sealing the glass blank at one end thereof to seal the lead assembly therein; and

substantially simultaneously with said sealing step, blow molding the glass blank to form the bulb portion of the lamp capsule, said blow molding resulting in a knit line about the surface of said bulb portion.

4,434,387

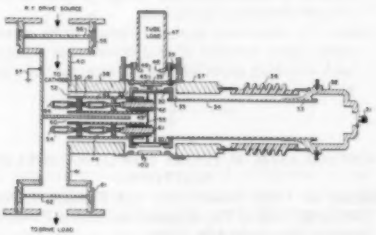
DC ISOLATED RF TRANSITION FOR CATHODE-DRIVEN CROSSED-FIELD AMPLIFIER

George H. MacMaster, Lexington, and Lawrence J. Nichols, Burlington, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Jul. 6, 1981, Ser. No. 280,406

Int. Cl.³ H01J *25/34*

U.S. Cl. 315—39.3 **8 Claims**



1. A radio frequency coupler for coupling to the cathode of a tube comprising:

a tube having a cathode comprising a slow wave structure;

means for coupling radio frequency energy into said cathode slow wave structure;

said coupling means comprising a waveguide and a radio frequency probe inserted into said waveguide;

means directly connecting electrically said probe to said cathode so that said probe is at the same direct-current potential as said cathode, said connecting means comprising the center conductor of a coaxial transmission line, said transmission line comprised of a first and second outer conductor coaxial with said center conductor, said first outer conductor being at ground potential, said second outer conductor being directly connected to said cathode and at said cathode potential, a radio frequency choke comprised of said first and second outer conductors electrically connecting said first and second outer conductors to each other by a low impedance at said radio frequency;

a vacuum chamber means containing said probe, said probe connecting means, and said cathode;

said probe being electrically isolated from said waveguide to withstand a direct-current voltage applied through said cathode to said probe.

4,434,388

ELECTRICAL LIGHTING CONTROLLER

LeRoy J. Carver, 7296 Claircrest Dr., Dayton, Ohio 45424, and John K. Penrod, 2111 Lakeman Dr., Bellbrook, Ohio 45305

Filed Sep. 3, 1981, Ser. No. 298,918

Int. Cl.³ G05F *1/00;* **H05B** *37/02, 39/04, 41/36*

U.S. Cl. 315—307 **29 Claims**

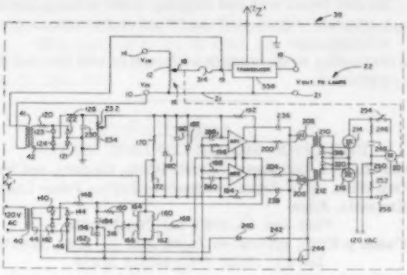
1. A controller for electrically controlling the amount of voltage to an electrical lighting load comprising:

a variable transformer having means for connecting said transformer winding to an electrical power source;

means for connecting the output of said transformer to said lighting load;

motor means for changing the number of turns of said transformer winding for changing the voltage of the output of said transformer to said lighting load; and,

means for controlling said motor means in the form of an electronic circuit comprising means for maintaining said winding at a high voltage output level for a predetermined period of time with circuit means for allowing said high output voltage to decrease to a lower output voltage of



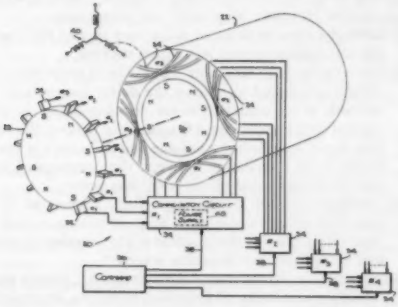
said transformer after said prescribed period of time wherein said circuit means comprises at least in part a control means in the form of a bi-directional ramping circuit that increases the voltage when an extra load is sensed in a more rapid manner than the decrease in voltage from the high voltage.

4,434,389

MOTOR WITH REDUNDANT WINDINGS

Lawrence W. Langley, Christiansburg, and Roger B. Bross, Radford, both of Va., assignors to Kollmorgen Technologies Corporation, Dallas, Tex.

Filed Oct. 28, 1980, Ser. No. 201,478
Int. Cl.³ H02K *29/00*
U.S. Cl. 318—254 **3 Claims**



1. A DC electric servomotor comprising:

a pair of relatively movable members, one being the stator and the other being the rotor of said electric servomotor;

said stator including at least two non-overlapping sets of distributed, non-overlapping redundant windings spaced apart for minimal magnetic coupling therebetween, each of said windings being independently energizable to produce a reversible magnetic field for rotating said rotor in either direction;

said redundant winding being mounted on said stator such that torque summing is achieved from the torques generated by the individual ones of said redundant windings; and

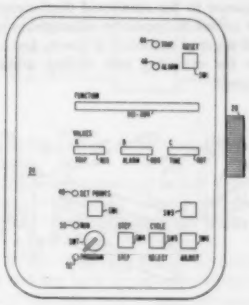
a separate commutation circuit for each set of redundant windings, said commutation circuits each being connected to a different one of said sets of redundant windings to produce the moveable magnetic field from a DC power supply for causing rotation of said rotor.

4,434,390

MOTOR CONTROL APPARATUS WITH PARALLEL INPUT, SERIAL OUTPUT SIGNAL CONDITIONING MEANS

Robert T. Elms, Monroeville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 15, 1982, Ser. No. 339,603
Int. Cl.³ H02P *3/00*
U.S. Cl. 318—473 **6 Claims**



1. A motor controller, comprising:

(a) digital control means electrically interconnected with a source of motor power and with an electric motor for conducting said power to said motor and for interrupting said power in response to a predetermined condition;

(b) a plurality of resistance temperature detector means for providing a multiplicity of analog signals one of which is indicative of the existence of said predetermined condition;

(c) a plurality of signal conditioning means each of which is interconnected with one of said resistance temperature detector means for converting the resistance value of said resistance temperature detector means to an analog voltage signal which is temperature related;

(d) first multiplex means interconnected at the input thereof in parallel with each of said signal conditioning means for converting said parallel analog voltage signal to serial analog voltage signals;

(e) analog to digital conversion means interconnected at the input thereof with said first multiplexer means for receiving said serial analog voltage signals and for providing at the output thereof parallel digital signals representative of said input analog voltage signals; and

(f) second multiplexer means interconnected with said analog to digital conversion means for converting said parallel digital signals to a serial train of signals, said digital train of signals being provided to said digital control means for providing a digital indication of said predetermined condition to said digital control means.

4,434,391

CAPACITIVE FEEDBACK TRANSDUCER AND CLOSED LOOP INSTRUMENT METER MECHANISM

Harold L. Swartz, Glendale; Randal A. Atkeisson, Phoenix; Rodney A. Carter, Phoenix, and Russell C. Parker, Phoenix, all of Ariz., assignors to Sperry Corporation, New York, N.Y.

Filed Jan. 15, 1982, Ser. No. 339,541
Int. Cl.³ G05B *6/02*
U.S. Cl. 318—662 **12 Claims**

1. A flight instrument for physically displaying command signals to a pilot, comprising:

a case,

servomotor means coupled to said case and responsive to said command signals for providing rotational displacement;

a capacitive transducer having at least first and second variable capacitors responsive to the rotational displacement of said servomotor means for providing feedback signals to said servomotor means, including;

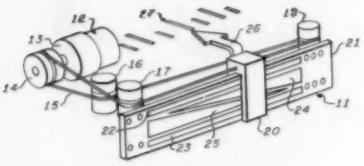
a substrate mounted on said case;

a first tapered conductive plate disposed on said substrate;

a second tapered conductive plate disposed on said substrate and substantially coextensive with said first conductive plate;

conductive means mounted to slide parallel to said substrate in response to the rotational displacement of said servomotor means in operative relationship with said first and second tapered conductive plates; and

means for coupling said sliding conductive means to ground;



bridge circuit means for providing output signals proportional to the difference in capacitance of said first and second variable capacitors including:

first rectifying means and first resistance means which are coupled to said first variable capacitor;

second rectifying means, oppositely poled to said first rectifying means, and second resistance means coupled to said second variable capacitor;

means for applying an alternating current to said first and second rectifying means; and

capacitive filter means coupled between ground and said first and second resistance means; and

a pointer coupled to said sliding conductive means, for providing the pilot with a visual display corresponding to said command signals.

4,434,392

CIRCUIT ARRANGEMENT FOR CONTROLLING THE COMMUTATION IN A STEPPING MOTOR

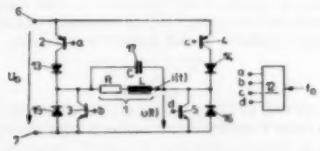
Georg Brasseur, Vienna, Austria, assignor to Friedmann & Maier Aktiengesellschaft, Austria

Filed Jul. 7, 1981, Ser. No. 281,116

Claims priority, application Austria, Jul. 10, 1980, A 3611/80

Int. Cl.³ G05B *19/40*

U.S. Cl. 318—696 **7 Claims**



1. A circuit arrangement for controlling commutation of a stepping motor comprising:

a four arm bridge circuit defining a bridge diagonal and having first, second, third and fourth switching transistors, one trasistor being in circuit in each arm, said first and second transistors being in adjacent arms on one side of said diagonal and said third and fourth transistors being in adjacent arms on the other side of said diagonal, said transistors being adapted to be switched by signals from a logic circuit for controlling the commutation of said stepping motor;

means for coupling a winding of said stepping motor across said bridge diagonal;

a capacitor coupled across said bridge diagonal so as to be in parallel circuit with said stepping motor winding and from a resonant circuit with an effective inductance of said winding; and

a decoupling diode in series with each of said first and third transistors.

4,434,393

INDUCTION MOTOR CONTROL SYSTEM

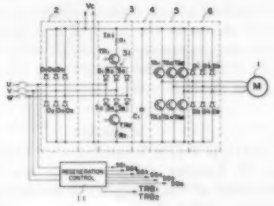
Katsuo Kobari, Tachikawa; Hiroshi Ishida, Hamura, and Naoto Ota, Hino, all of Japan, assignors to Fujitsu Fanuc Limited, Kawasaki, Japan

Filed Jun. 16, 1982, Ser. No. 388,926

Claims priority, application Japan, Jun. 16, 1981, 56-92795

Int. Cl.³ H02P *7/62*; H02M *5/458*

U.S. Cl. 318—757 **3 Claims**



1. An induction motor control system, for controlling the actual speed of an induction motor in accordance with a commanded speed, the system having a braking mode in which a regenerative current is generated, and comprising:

a rectifier connectable to an AC power supply for converting alternating current into direct current;

a transistor inverter including a pluarlity of transistors operatively connected to receive the direct current and connectable to the induction motor, for converting the direct current into three-phase AC signals for driving the induction motor and having a voltage and frequency in conformance with a deviation between the commanded speed and the actual speed of the induction motor;

an inverter control circuit operatively connected to the transistor inverter, for providing switching signals for controlling the switching action of the plurality of transistors comprising the transistor inverter;

a regenerative circuit connectable to the AC power supply including a plurality of switching elements, the regenerative circuit being connected in parallel with the transistor inverter for controlling the flow of the regenerative current during braking;

a smoothing capacitor operably connected in parallel with the transistor inverter and to receive the direct current;

a regeneration control circuit connectable to the AC power supply and operatively connected to the regenerative circuit, for controlling the regenerative circuit switching elements; and

detecting means operatively connected to the smoothing capacitor, and between the inverter control circuit and the transistor inverter for detecting one of the magnitude of the smoothing capacitor voltage and the magnitude of the regenerative current, for temporarily disabling the transistor inverter when the one of the magnitude of said smoothing capacitor voltage and said regenerative current exceeds a predetermined value, and for enabling the transistor inverter when the one of the magnitude of said smoothing capacitor voltage and said regenerative current drops below said predetermined value.

4,434,394

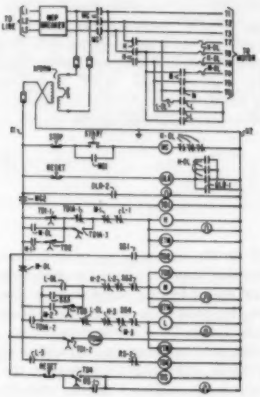
CIRCUIT FOR CONTROLLING MULTIPLE RATED MOTORS

Walter J. Kellogg, Brighton Township, Beaver County, Pa.; Arden L. Scott, La Crescenta, and Samuel K. Seneadza, Carson, both of Calif., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 178,047, Aug. 14, 1980, abandoned. This application Oct. 8, 1982, Ser. No. 433,494

Int. Cl.³ H02P 1/26

U.S. Cl. 318—771 3 Claims



1. A circuit for controlling a multi-rated motor, comprising:

a high torque contactor for connecting electrical power to the windings of a multi-rated motor such that the windings are first connected in a Δ-delta configuration;

(b) a first timer means electrically connected to the high torque contactor and a low torque contactor for de-energizing the high torque contactor and energizing the low torque contactor to change the connection of electrical power to the windings such that the windings are connected to a γ-wye configuration after a predetermined time interval;

(c) a low torque overload means connected to the low torque contactor and the γ-wye connected windings for causing the low torque contactor to de-energize and energize a medium torque contactor to change the connection of electrical power to the windings such that the windings are connected in a γ-Δ-partial wye, partial delta configuration if the current in the windings exceed a predetermined current level;

(d) a medium torque monitoring means for causing the windings to be switched back to a wye configuration after operating a predetermined time in the partial wye, partial delta configuration;

(e) a medium torque overload means connected to the medium torque contactor and the γ-Δ partial wye, partial delta, windings for de-energizing the medium torque contactor and energizing the high torque contactor to change the connection of electrical power to the windings such that the windings are connected in a Δ-delta configuration if the current in the windings exceed a predetermined current level;

(f) a high torque monitoring means for causing the windings to be switched back to (a partial wye, partial delta) configuration after operating a predetermined time in the delta configuration; and

(g) high torque overload means connected to the high torque contactor and the Δ-delta connected windings for causing the disconnection of electrical power to the windings if the current in the windings exceed a predetermined current level.

4,434,395

SOLAR CELL POWER SUPPLY CIRCUIT

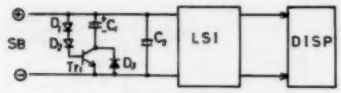
Masayuki Higuchi, Ueno, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Feb. 25, 1982, Ser. No. 352,154

Claims priority, application Japan, Feb. 25, 1981, 56-27387; Feb. 25, 1981, 56-27388; Mar. 30, 1981, 56-47957

Int. Cl.³ H02J 9/00

U.S. Cl. 320—1 7 Claims



1. A solar cell power supply circuit comprising:

a solar cell or cells;

a first back-up capacitor connected to said solar cells;

first circuit means for deciding whether the electromotive force developed by said solar cells lies within a range of operation for a load of said solar cells;

second circuit means responsive to said first circuit means for charging said first back-up capacitor when the electromotive force of said solar cells is over said range of operation for said load; and

a second back-up capacitor for supplementing the operation of said first back-up capacitor when only a minimum of incident light is available for said solar cells.

4,434,396

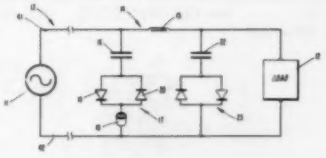
POWER LINE TRANSIENT SUPPRESSION CIRCUIT

Herbert R. Montague, 75 Clifton Blvd., Binghamton, N.Y. 13903

Filed Nov. 2, 1981, Ser. No. 317,236

Int. Cl.³ H02H 1/04

U.S. Cl. 323—230 15 Claims



10. A low pass filter circuit for substantially preventing pulse transients from being coupled between a power source and a load comprising a series branch containing an inductor, a shunt branch containing in series a capacitor, a bi-directional breakdown device having a predetermined threshold conduction level with a dead band, and a magnetic core inductively coupled to the branch.

4,434,397

REMOTE LOAD CURRENT SENSOR

Conrad E. Nelson, Camillus, N.Y., assignor to General Electric Company, Syracuse, N.Y.

Filed Dec. 24, 1981, Ser. No. 334,084

Int. Cl.³ C01R 27/04

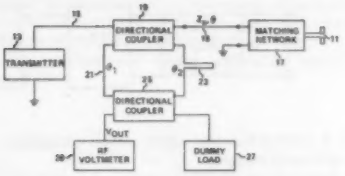
U.S. Cl. 324—58 R 7 Claims

1. Measurement apparatus for determining the amplitude and phase of an RF load parameter in a remote load element coupled to its power source through a transmission line of characteristic impedance Z_o and a load matching network of known characteristics, comprising:

(a) a first directional coupler interposed in said transmission line between the power source and load matching net-

work, said coupler providing first and second output signals respectively proportional to the incident and reflected voltages V_i and V_r at the input to said matching network;

(b) first and second transmission line elements connected to receive said coupler output signals, said transmission line elements being of different phase lengths so as to introduce a relative phase shift of predetermined magnitude as between the first and second output signals;



(c) a second directional coupler having as inputs thereto said first and second output signals as respectively coupled through said first and second transmission line elements and providing a voltage output V_o proportional to the V_i and V_r signals combined in the phase relationship predetermined by said transmission line elements; and

(d) means for measuring the amplitude and phase of a voltage output of said second directional coupler thereby to obtain a measure of the desired parameter in said remote load element.

4,434,398

POROUS PASSAGE MEANS AND METHOD FOR PARTICLE ANALYZING SYSTEMS

Robert H. Berg, Elmhurst, and Richard F. Karuhn, Downers Grove, both of Ill., assignors to Particle Data, Inc., Elmhurst, Ill.

Division of Ser. No. 907,010, May 18, 1978, Pat. No. 4,290,011. This application May 15, 1981, Ser. No. 264,199

Int. Cl.³ G01N *27/00*

U.S. Cl. 324—71.4 **14 Claims**

1. Apparatus for controlling the presentation of particles in fluid suspension to a sensing zone to facilitate particle parameter determination in a particle analysis system of a type responsive to electrical signals generated by particles passing through the sensing zone, comprising:

means defining an elongate passage for transporting the particles in suspension therethrough for sensing zone presentation at a downstream end of the passage;

said passage means comprising a porous wall;

means for supplying particle-containing fluid to an entrance into said passage, and for supplying sheathing fluid to said porous wall outwardly relative to said passage;

and means for effecting differential pressure for causing a particle-containing stream to traverse said passage from said entrance to said downstream end and for causing movement of said sheathing fluid through said porous wall into sheathing relation to said particle-containing stream.

4,434,399

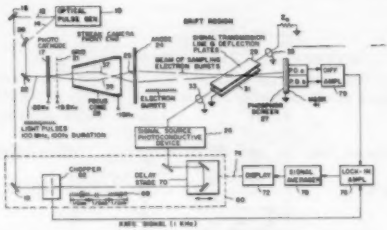
ELECTRON-OPTICAL WIDE BAND SIGNAL MEASUREMENT SYSTEM

Gerard Mourou, Rochester, N.Y.; Janis A. Valdmanis, Columbus, Ind., and Steven L. Williamson, Henrietta, N.Y., assignors to The University of Rochester, Rochester, N.Y.

Filed May 14, 1982, Ser. No. 378,379

Int. Cl.³ G01R *31/00*

U.S. Cl. 324—96 **20 Claims**



1. A system for the measurement of an electrical signal with picosecond resolution which comprises means for generating a train of optical pulses having subpicosecond durations, means responsive to the pulses for generating a beam of sampling electron bursts, means for electron-optically sampling successively occurring portions of said signal with successive ones of said electron bursts, and means responsive to the output of said sampling means for providing a display of said signal.

4,434,400

CIRCUIT FOR SUPERVISING AN ELECTRONIC ELECTRICITY METER

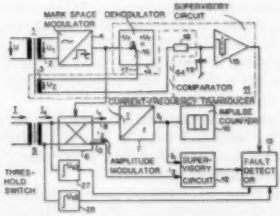
Mathis Halder, Baar; Jakob Widmer, Zug, and Jacob De Vries, Allenwinden, all of Switzerland, assignors to LGZ Landis & Gyr Zug AG, Zug, Switzerland

Filed Apr. 27, 1981, Ser. No. 257,915

Claims priority, application Switzerland, May 2, 1980, 3427/80

Int. Cl.³ G01R *1/36*; G08B *23/00*

U.S. Cl. 324—110 **19 Claims**



1. In an electronic energy consumption meter having an alternating voltage input and an alternating current input, voltage-measurement means for forming a first signal proportional to said alternating voltage input, current measurement means including a current transformer having secondary winding means, for forming a second signal proportional to said alternating current input, mark-space modulator means controlled by one of said signals generating a substantially rectangular waveform, amplitude modulator means including a polarity switch and having a first and a second output and being controlled by the other of said signals for modulating said substantially rectangular waveform, current-frequency transducer means being coupled to said secondary winding means of said current transformer through said polarity switch and

being coupled to said amplitude modulator means and generating impulses, and impulse counter means for counting the impulses generated by said current-frequency transducer means,

in combination,

first supervisory circuit means coupled to, and supervising, said mark-space modulator means,

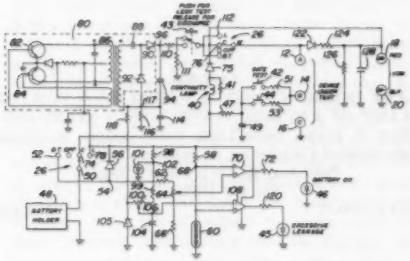
second supervisory circuit means coupled to, and supervising, at least said current-frequency transducer means, said second supervisory circuit means including comparison means for comparing at least a value derived from the output frequency of said current frequency transducer means with at least a parameter derived from the current flowing in said secondary output of said amplitude modulator means, and

fault indicator means coupled to the output of each of said supervisory circuit means for indicating a fault in said meter.

4,434,401
APPARATUS FOR TESTING SEMICONDUCTOR DEVICES AND CAPACITORS

Robert A. York, Mechanicsburg, Pa., assignor to Flight Systems, Inc., Mechanicsburg, Pa.

Filed May 4, 1981, Ser. No. 260,467
Int. Cl.³ G01R *31/02*
U.S. Cl. 324—158 SC **16 Claims**



1. Apparatus for testing semiconductor devices in both the conducting and non-conducting states, comprising:

(a) first circuit means for testing the continuity of a semiconductor device in a polarity in which the semiconductor device is normally conducting;

(b) a battery source of direct current at a relatively low voltage of under approximately 24 volts, said relatively low voltage being applied to the first circuit means;

(c) means for providing a signal whenever the first means determines that the semiconductor device is in a conducting state;

(d) second circuit means for testing for leakage current flow through a semiconductor device connected in a polarity in which the semiconductor device is normally non-conducting;

(e) a dc to dc converter for boosting the relatively low voltage dc to a relatively high voltage dc of approximately 200 volts, said relatively high voltage dc being applied to the second circuit means;

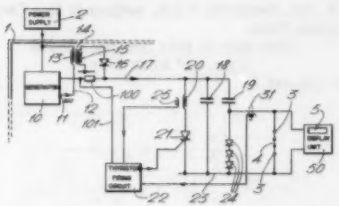
(f) means for providing a signal whenever the second circuit means determines that there is excessive leakage current flow through the semiconductor device; and

(g) switch means for selecting between the first circuit means and the second circuit means;

4,434,402
ELECTRICAL EQUIPMENT

Michael J. Lane, Mablethorpe, England, assignor to Smiths Industries Public Limited Company, London, England

Filed Aug. 10, 1981, Ser. No. 291,692
Claims priority, application United Kingdom, Aug. 23, 1980, 8027514
Int. Cl.³ G01R *31/024, 31/22*
U.S. Cl. 324—393 **9 Claims**

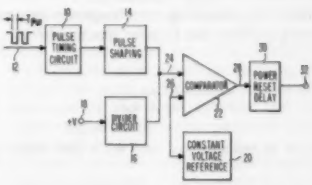


6. Equipment for testing operation of electrical igniters, comprising: capacitive means; means connecting said capacitive means with said igniter; a voltage source that increases the voltage across said capacitive means; means for automatically applying a voltage developed across said capacitive means to said igniter at predetermined intervals; the equipment automatically applying the same voltage across said igniter repeatedly for a predetermined number of times if breakdown occurs; and display means that provides a representation of the voltage at which said repeated breakdown occurs.

4,434,403
UNIVERSAL RESET CIRCUIT FOR DIGITAL CIRCUITRY

Gerald W. Chang, San Pedro, Dominican Republic, assignor to Burroughs Corporation, Detroit, Mich.

Filed Aug. 24, 1981, Ser. No. 295,423
Int. Cl.³ H03K *5/24, 5/153*
U.S. Cl. 328—120 **10 Claims**



1. A universal reset circuit for digital circuitry which monitors clock pulses and DC voltage and provides a reset command when detecting a low DC voltage or a missing clock pulse comprising:

a constant voltage means for providing a stable reference voltage;

a pulse timing means receiving said clock pulses for providing an output voltage level above said reference voltage when a regular clock pulse is received and allowing its output voltage to fall below said reference voltage when a clock pulse does not appear within a set time interval generating a low output pulse;

a divider means connected across the DC voltage for producing a test voltage which is less than said reference voltage when a low DC voltage condition is experienced;

a comparator which compares a combined input from said bridge means and said pulse timing means with said constant voltage means such that said comparator output will be high unless a missing clock pulse is detected which will produce a negative reset pulse or, unless a low DC voltage

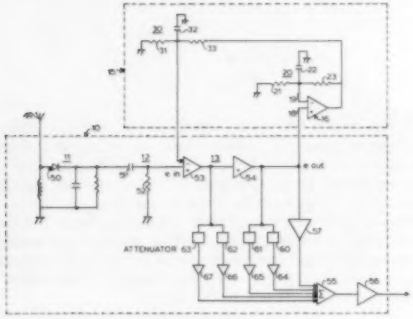
is detected which will produce a low output from said comparator.

4,434,404

A.C. COUPLED VIDEO AMPLIFIER WITH FAST PULSE RECOVERY

Victor K. Fay, Sunnyvale, Calif., assignor to Itek Corporation, Lexington, Mass.

Filed Mar. 6, 1981, Ser. No. 241,296
Int. Cl.³ H03F 1/34
U.S. Cl. 330—85 **2 Claims**



1. In a multistage amplifier for alternating current signals the improvement for decreasing the pulse recovery time comprising:

a negative feedback loop disposed between the output of one and the input of any previous of the stages of said amplifier, said feedback loop comprising means for limiting the feedback signal to a selected amplitude whereby signals applied to the feedback look above said selected amplitude make the feedback loop inoperative,

said feedback loop including two frequency dependent filters having together the transfer function of

$$\frac{p^2}{p^2 + 2\alpha p + w_o^2}$$

wherein p=jw in radians/sec., and w_o is $2\pi f$ where f is the frequency.

4,434,405

MULTIPLE AMPLIFIER INTERCONNECTION FOR OPTIMAL SENSITIVITY

Michael J. Gans, Monmouth Beach Township, Monmouth County, and William W. Snell, Jr., Middletown Township, Monmouth County, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

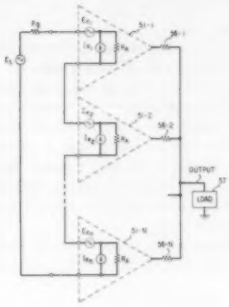
Filed Apr. 19, 1982, Ser. No. 369,497
Int. Cl.³ H03F 1/26, 3/68
U.S. Cl. 330—149 **4 Claims**

1. A low noise circuit for providing amplified electrical signals comprising

a source of electrical signals including a predetermined source resistance R_g

characterized in that

a plurality of N like amplifiers are connected together, each amplifier includes a predetermined rms noise voltage E_R and a predetermined rms noise current I_R; and



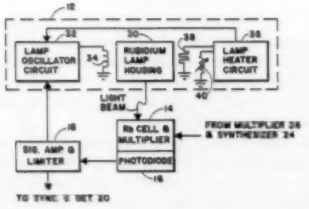
the plurality of N like amplifiers are connected in series, where N is substantially equal to the quantity $(I_R R_g)/E_R$, for R_g greater than E_R/I_R.

4,434,406

LAMP HOUSING ASSEMBLY PRIMARILY FOR THE LAMP OF A RUBIDIUM FREQUENCY STANDARD

William R. Fowks, Yorba Linda, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Aug. 10, 1981, Ser. No. 291,606
Int. Cl.³ H03L 7/26
U.S. Cl. 331—3 **15 Claims**



12. An improved lamp assembly for igniting a discharge in a rubidium lamp in a rubidium vapor cell frequency standard of the type used for stabilizing a frequency source by tracking it to hyperfine resonance of a rubidium vapor cell resonator optically pumped by a rubidium light beam generated by said rubidium lamp, and having a photodiode for detecting resonance; the lamp assembly comprising:

a field coil in proximity to said lamp,

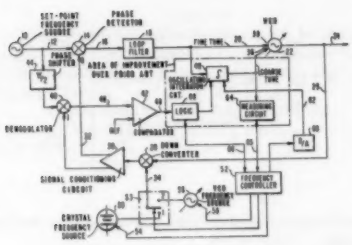
means for generating a periodic signal through said coil, and

means for heating said lamp to a selected operating temperature, said heating means having first and second heat generating devices connected in series for distributing said lamp heating function between said devices and around substantially the entire periphery of said lamp.

4,434,407
PRESETTING CIRCUIT FOR THE VOLTAGE-CONTROLLED OSCILLATOR OF A PHASE LOCK LOOP

Daniel J. Healey, III, and Steven Morrison, both of Baltimore, Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 6, 1981, Ser. No. 251,554
Int. Cl.³ H03L 7/12, 7/16
U.S. Cl. 331—4 7 Claims



1. A phase lock loop circuit operative to switch rapidly between predetermined output frequency signals as governed by a reference frequency signal and a preset signal which are both set to a new level for each desired change in output frequency signal, the desired change in output frequency signals being, at times, greater than the operational frequency bandwidth of said phase lock loop circuit, said phase lock loop circuit including: a voltage controlled oscillator (VCO) governed by a tuning signal to generate the output frequency signal of said phase lock loop circuit; means for operating on a said output frequency signal by said reference frequency signal to generate a feedback frequency signal; a phase detector for generating a phase error signal representative of the phase difference between said feedback frequency signal and a set-point frequency signal; a loop filter for filtering said phase error signal and means for detecting a phase lock condition of said phase lock loop circuit and for generating a phase lock signal indicative thereof; and wherein the iprovement comprises a circuit for generating said tuning signal for controlling the output frequency signal of said VCO, said generating circuit including:

an amplifier circuit having an input for coupling said preset signal to said generating circuit;

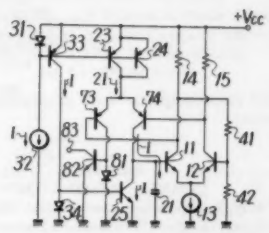
an integrator circuit having its output coupled to the input of said amplifier circuit through a feedback path, the output signal generated by said integrator circuit being said tuning signal for said VCO; and

switching means operative in a first state momentarily to render said integrator circuit responsive to said amplifier circuit to preset the output signal of said integrator circuit proportional to said preset signal applied to the input of said amplifier circuit, said switching means operative in a second state to render said integrator circuit responsive to a reference signal which controls the rate of the output signal of said integrator circuit from its preset level in a direction to cause phase lock of said loop circuit, said switching means operative in a phase lock state as governed by said phase lock signal to render said integrator circuit responsive to said filtered phase error signal, whereby said loop circuit becomes closed to maintain the phase lock condition thereof.

4,434,408
OSCILLATOR HAVING CAPACITOR CHARGING AND DISCHARGING CONTROLLED BY NON-SATURATING SWITCHES

Yasuharu Baba, Atsugi, and Masashi Takeda, Isehara, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Mar. 10, 1981, Ser. No. 242,395
Claims priority, application Japan, Mar. 11, 1980, 55-30551
Int. Cl.³ H03K 3/023, 3/282
U.S. Cl. 331—111 6 Claims



1. An oscillator comprising:

(a) a DC voltage source;

(b) a differential amplifier having a hysteresis characteristic and consisting of first and second transistors, each having input and output electrodes, a feedback circuit connected between said output electrode of said first transistor and said input electrode of said second transistor, and first and second loads connected between the output electrodes of said first and second transistors and said DC voltage source, respectively;

(c) a capacitor means connected between the input electrode of said first transistor and a reference point;

(d) current source means connected to said DC voltage source and having a main current path producing a predetermined constant current;

(e) current sink means having a main current path connected between the input electrode of said first transistor and said reference point and substantially one-half of said predetermined constant current flowing through said current sink means;

(f) first current switching means connected between the main current path of said current source means and the connection point of said capacitor means with the input electrode of said first transistor and controlled by an output signal of the output electrode of said second transistor; and

(g) second current switching means connected between the main current path of said current source means and said reference point through a third load and controlled by an output signal of the output electrode of said first transistor, thereby to produce an output pulse signal across said third load.

4,434,409
DIELECTRIC WAVEGUIDE PHASE SHIFTER

Jerome J. Green, Lexington, Mass., assignor to Raytheon Company, Lexington, Mass.

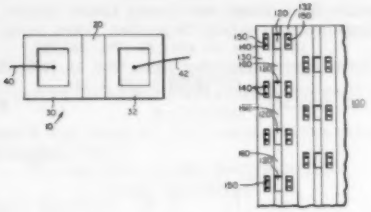
Filed Jun. 11, 1981, Ser. No. 272,809
Int. Cl.³ H01P 1/195
U.S. Cl. 333—24.1 28 Claims

1. In combination:

means providing a dielectric waveguide having an input port and output port, comprising a dielectric and a ferrimagnetic toroid disposed adjacent to said dielectric, for confining an applied electromagnetic wave substantially in the dielectric as such electromagnetic propagates through the dielectric; and

means for passing a current through said toroid to provide a

magnetic field in a portion of said toroid and to provide, in response thereto, a selectable amount of phase shift to the



applied electromagnetic wave propagating through said dielectric.

4,434,410

COAXIAL RESONATOR

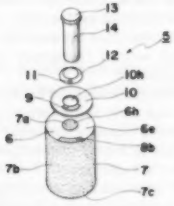
Hideyuki Miyake, Matsubara, and Tosiaki Nakamura, Kyoto, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Jul. 16, 1982, Ser. No. 399,135

Claims priority, application Japan, Jul. 23, 1981, 56-115742

Int. Cl.³ H01P *7/04, 1/202*

U.S. Cl. 333—224 **5 Claims**



1. A coaxial resonator which comprises:

a coaxial resonator main body including a cylindrical dielectric member, an electrode layer continuously formed over an inner peripheral surface, an outer peripheral surface and one end face of said dielectric member, and a stator electrode formed on the other end face of said dielectric member not formed with said electrode layer, and

a rotor member of a dielectric material rotatably held in close contact with said the other end face of said coaxial resonator main body on which said stator electrode is formed, and provided with a rotor electrode confronting said stator electrode,

said coaxial resonator being arranged to vary capacity between said stator electrode and said rotor electrode by rotating said rotor member.

4,434,411

TEMPERATURE-SENSITIVE SWITCH

Philip M. Anderson, III, Chatham, N.J.; James E. Kearney, New Hyde Park, N.Y., and Scott E. Gordon, Morristown, N.J., assignors to Allied Corporation, Morristown, N.J.

Filed Mar. 10, 1982, Ser. No. 356,710

Int. Cl.³ H01H *61/013*

U.S. Cl. 335—208 **12 Claims**

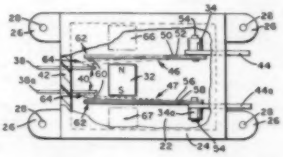
1. A temperature-sensitive switch, comprising:

base means for mounting said temperature-sensitive switch;

a resilient movable cantilever carrying a first contact member, said cantilever being composed of amorphous ferromagnetic material having a Curie point, wherein said amorphous ferromagnetic material consists essentially of a composition defined by the formula $M_xM'_aZ_y$, where M is at least one metal selected from the group consisting of Fe and Co, M' is at least one alloying metal selected from the group consisting of Ni, Ti, V, Cr, Mn, Zr, Nb, Mo, Hf, Ta, W, Zn, Al, and Cu, Z is at least one metalloid element selected from the group consisting of B, Si, C and P, x, a, and y are in atomic percent and range from about 70–85, 0–12 and 15–30, respectively, and the sum x+a+y equals 100;

a second contact member disposed adjacent said first contact member for at least intermittently establishing electrical contact with said first contact member;

said first contact member being connected to first terminal means, and



said second contact member being connected to second terminal means;

gripping means for supporting the cantilever and electrically connecting it to said first terminal means;

support means for supporting said second terminal means; and

magnet means associated with and adapted to bias said cantilever to a first position that establishes electrical continuity between said first and second contact members said cantilever being transformed from a ferromagnetic phase to a paramagnetic phase when its temperature exceeds the Curie point, whereby said cantilever assumes a second position in which said electrical continuity is interrupted.

4,434,412

CONTACTLESS, ELECTRIC CONTROL-HANDLE

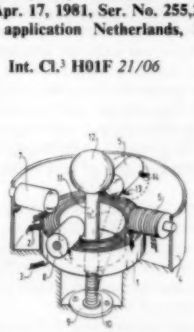
Geurt J. Ruumpol, Wilp, Netherlands, assignor to Inductive Control Systems B.V., Ede, Netherlands

Filed Apr. 17, 1981, Ser. No. 255,292

Claims priority, application Netherlands, May 12, 1980, 8002727

Int. Cl.³ H01F *21/06*

U.S. Cl. 336—134 **4 Claims**



1. A contactless electric control device comprising:

a generally annular field coil presenting an open central region and including means connecting it to an alternating current source for producing an alternating magnetic field whose instantaneous lines of magnetic flux extend longitudinally through said open central region;

a plurality of inductive pick-ups disposed in coplanar relation in spaced relation to one end of said field coil, the plane containing said pick-ups being perpendicular to the longitudinal axis of said open central region of the field coil, said longitudinal axis being the axis of said field coil and each pick-up including a core extending radially with

respect to such longitudinal axis with the inner end of each such core being disposed radially beyond such open central region, said cores being angularly spaced within said plane around said longitudinal axis, each pick-up also including a winding on its core and opposed pairs of such windings being connected in series; and

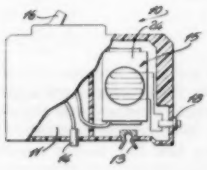
movable core means projecting at least in part longitudinally into said central region generally along said longitudinal axis and in radially inwardly spaced relation to said field coil for affecting said alternating magnetic field such that there is a linear relation between displacement of said core means and output signals produced by said opposed pairs of windings.

4,434,413

ELECTRICAL CIRCUIT BREAKER MODULE

Jean-Marc Pelletier, St-Louis de Terrebonne, and Yvon Dion, McMasterville, both of Canada, assignors to Hydro-Quebec, Montreal, Canada

Filed Oct. 20, 1981, Ser. No. 313,214
Int. Cl.³ H01H *71/16*
U.S. Cl. 337—71 **11 Claims**



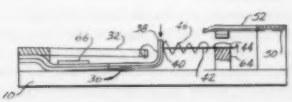
1. In combination with an electrical circuit-breaker module of the narrow modular type connectible in stacked relationship with a plurality of said modules in an electrical distribution panel, each said module being associated with a respective electrical distribution branch circuit and wherein circuit interruption means is provided in each module for interrupting its associated electrical distribution branch circuit upon the occurrence of predetermined overload and fault currents on said branch circuit, the improvement comprising a controlled switch means mounted in at least one of said modules without altering the thickness of said module in a vertical plane and the depth thereof, said controlled switch means being connected in series with said circuit interruption means and being operable by command means exteriorly of said module to assume an open or closed contact condition.

4,434,414

SNAP-ACTING THERMAL RELAY

Lon E. Bell, and William P. Gruber, both of Altadena, Calif., assignors to Technar, Inc., Arcadia, Calif.

Continuation-in-part of Ser. No. 174,916, Aug. 4, 1980. This application Mar. 31, 1981, Ser. No. 249,383
Int. Cl.³ H01H *61/04*
U.S. Cl. 337—102 **10 Claims**



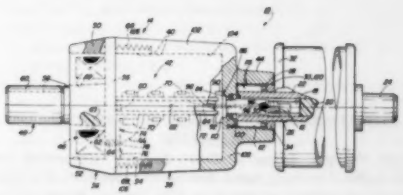
1. A snap-acting switching device comprising a fulcrum member, a switch arm pivotally supported on the fulcrum member, spaced stop means including at least one switch contact forming a gap receiving the switch arm for limiting rotation of the switch arm relative to the fulcrum, a tension spring having one end connected to the switch arm on one side of the fulcrum, means anchoring the other end of the spring on the opposite side of the fulcrum, a cantilever supported thermal-responsive element that moves with changes in temperature, and means connected with the moving end of the thermal-responsive element for moving the fulcrum relative to the tension spring to either side of the centerline of the spring with heating and cooling of the thermal-responsive element.

4,434,415

ELECTRICAL CONTROL MODULE FOR A CURRENT-LIMITING FUSE

John M. Jarosz, Skokie, and William R. Panas, Glenview, both of Ill., assignors to S&C Electric Company, Chicago, Ill.

Filed Nov. 5, 1982, Ser. No. 439,443
Int. Cl.³ H01H *85/20*
U.S. Cl. 337—186 **17 Claims**



1. An electrical control module connectable to an interrupting module having a normally closed, power-cartridge-operated switch in shunt with a fusible element, one side of both the switch and the fusible element being connectable to one side of a protected circuit, which control module comprises:

a conductive housing having a closed cavity which is capable of surrounding an electrical control circuit and acting as an environmental shield and Faraday cage thereof;

means for supporting the control circuit in the cavity and for transmitting output signals therefrom to the exterior of the housing;

first means for connecting the housing to the other side of the protected circuit;

second means for connecting the housing to the interrupting module so that the housing is electrically continuous with the other side of both the switch and the fusible element and so that the output signals of the control circuit are applied to the power cartridge by the supporting and transmitting means; and

means on the exterior of the housing for sensing the condition of the current of the protected circuit and for providing signals representative thereof to an input of the control circuit.

4,434,416

THERMISTORS, AND A METHOD OF THEIR FABRICATION

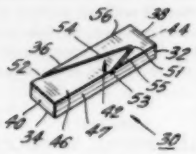
Milton Schonberger, 1 Century Tower, Ft. Lee, N.J. 07024

Filed Jun. 22, 1983, Ser. No. 506,805
Int. Cl.³ H01C *1/142, 7/18, 17/24*
U.S. Cl. 338—22 R **29 Claims**

1. A thermistor, or the like electric component, comprising a wafer-like piece of ceramic thermistor ware, or the like, having two large area opposite surfaces, the piece of thermistor ware having two spaced apart opposite edges; a layer of electric contact material covering at least one of the surfaces of the piece; and

a contact defining score mark extending completely through the layer of contact material and completely across the piece between its opposite edges for defining two separate

contacts from the layer of contact material on the piece; the contact defining score mark having an open geometric



shape other than a straight line extending between the edges of the piece.

4,434,417

LIQUID-COOLED POWER RESISTOR AND USE THEREOF

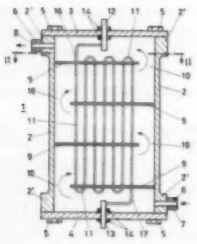
Conrad Beriger, Aarau; Ladislav Kucera, Gebenstorf; Paul Schneider, Untersiggenthal, and Günther Spittaler, Fislisbach, all of Switzerland, assignors to BBC Brown, Boveri & Company Limited, Baden, Switzerland

Filed May 3, 1982, Ser. No. 374,145

Claims priority, application Switzerland, May 21, 1981, 3322/81

Int. Cl.³ H01C *1/08*

U.S. Cl. 338—53 **7 Claims**



1. A liquid-cooled power resistor, comprising:

means defining a closed housing;

at least one resistive conductor arranged in said closed housing;

at least two diaphragms fixed within said closed housing;

said diaphragms possessing holes for the passage of said resistive conductor therethrough, in order to thus form holding means for said resistive conductor;

said diaphragms being fixed within said closed housing so as to obturate only a portion of the cross-section of the closed housing, in order to thereby form free cross-sections;

said closed housing containing a cooling liquid and being provided with means for flowing said cooling liquid through said housing;

said free cross-sections formed by means of said diaphragms in the closed housing being open for the throughflow of said cooling liquid therethrough and being staggered with respect to one another in order to deflect cooling liquid; and

said resistive conductor being located directly in said cooling liquid within said closed housing.

4,434,418

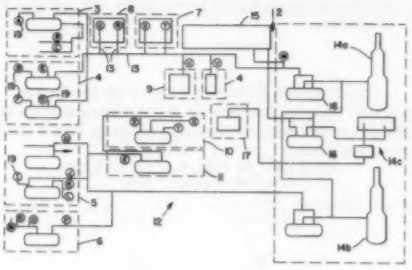
ULTRASENSITIVE APPARATUS AND METHOD FOR DETECTING CHANGE IN FLUID FLOW CONDITIONS IN RELIEF FLOWLINES ASSOCIATED WITH A CHEMICAL OR REFINERY COMPLEX

Stephen F. Streib, Novato, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Sep. 5, 1980, Ser. No. 184,560

Int. Cl.³ G08B *21/00*; G01F *1/68*

U.S. Cl. 340—606 **9 Claims**



1. Method of providing detection of fluid flow in a series of relief flowlines of a relief-flare system associated with process units of a chemical or refinery complex whereby sources of relief discharge therein can be pinpointed comprising:

(a) positioning heat flux sensing transducer-meter means exterior of but in heat conducting contact in at least one of said flowlines while maintaining integrity of said at least one flowline intact;

(b) monitoring change in fluid flow in said at least one flowline, by generating a transient cascaded output signal proportional to transient variation in heat flux detected exterior of said at least one flowline at said transducer-meter; and

(c) indicating the occurrence of said transient cascaded signal output so as to pinpoint location of relief discharge from one or more associated process units of said chemical or refinery complex.

4,434,419

CURSOR CONTROL CIRCUIT FOR PLURAL DISPLAYS FOR USE IN A WORD PROCESSING SYSTEM

Robert A. Couper, Sunnyvale, and Terrance L. Lillie, Palo Alto, both of Calif., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Aug. 12, 1980, Ser. No. 177,328

Int. Cl.³ G09G *1/00*

U.S. Cl. 340—717 **22 Claims**

1. In a word processing system of the type having a keyboard for entering alphanumeric data, a system for cursor control, comprising:

(a) a first display means for displaying a plurality of lines of alphanumeric text;

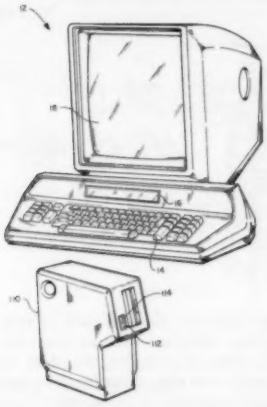
(b) a first display control circuit means coupled between said keyboard and said first display means for controlling the information exhibited on said first display means;

(c) said first display control circuit means including first cursor control circuit means for causing visual marking of a predetermined number of alphanumeric characters exhibited on said first display means, said first cursor control circuit means being actuated by said keyboard;

(d) a second display means for displaying a predetermined number of alphanumeric characters being at least part of the number of characters exhibitable on one of said plurality of lines of said first display means; and

(e) a second display control circuit means coupled between

said keyboard and said second display means for controlling the information exhibited on said second display means, said second display control circuit means including second cursor control circuit means for causing visual



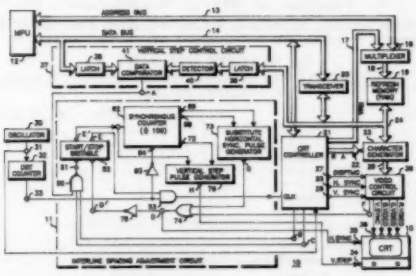
marking on said second display means of those marked predetermined alphanumeric characters on said first display means which are exhibited on said second display means.

4,434,420

INTERLINE SPACING ADJUSTMENT CIRCUIT IN A SCANNING CRT VISUAL DISPLAY SYSTEM

Joseph Bujalski, Roselle, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 21, 1982, Ser. No. 390,588
Int. Cl.³ G09G 1/16
U.S. Cl. 340—724 **12 Claims**



1. A scanning CRT visual display system in which sequential horizontal visual display lines having predetermined vertical interline spacings between are selectively provided, said display system comprising;

a CRT controlled circuit means for providing vertical and horizontal sync pulses for controlling CRT electron beam sweeping which produces said sequential horizontal visual display lines that together form a composite visual display frame,

clock means coupled to said CRT controller circuit means for providing thereto fixed frequency clock timing pulses which determine the occurrence of said vertical and horizontal sync pulses, and

a CRT display station means, which includes a CRT for receiving said vertical and horizontal sync pulses, as well as video information signals, and providing said composite visual display frame in accordance therewith;

the improvement comprising an adjustable vertical spacing horizontal interline control circuit comprising the combination of;

terminal means for receiving a vertical step control signal indicative of a desired increase in the normal vertical interline spacing between sequential horizontal scan lines;

gate means coupled between said clock means and said controller circuit means and also coupled to said terminal means for selectively preventing, for a predetermined time, said clock pulses from being received by said controller circuit means in response to at least the occurrence of said step control signal thereby effectively halting the operation of said controller circuit means;

counter means coupled to said terminal means and said clock means for effectively counting said clock pulses during the time that said clock pulses are prevented from being received by said controller circuit means and for providing at least one substitute horizontal sync pulse in response to said counter means attaining a predetermined count of said clock pulses, and

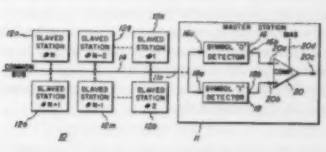
signal combiner means coupled to said controller circuit means and said counter means for effectively combining said controller circuit means horizontal output sync pulses and said substitute horizontal sync pulses to provide a composite horizontal sync control signal which is coupled to said CRT display station means for control of said CRT visual display, whereby during the implementation of an increase in the normal vertical spacing between sequential horizontal display lines, horizontal sync pulses are effectively continuously provided even though the time required for implementing the increased vertical spacing may exceed the retrace time normally provided between sequential horizontal visual display lines.

4,434,421

METHOD FOR DIGITAL DATA TRANSMISSION WITH BIT-ECHOED ARBITRATION

Lewin T. Baker; Sanjay K. Bose, both of Schenectady, N.Y., and Paul G. Huber, West Warwick, R.I., assignors to General Electric Company, Schenectady, N.Y.

Filed Nov. 18, 1981, Ser. No. 322,495
Int. Cl.³ H04Q 3/00
U.S. Cl. 340—825.51 **16 Claims**



1. A method for arbitration of contended digital data communications in a system having a master data station and a plurality of slaved data stations interconnected by a single common data transmission medium, with each data station being capable of transmitting and receiving data via the single common medium, comprising the steps of:

(a) transmitting from at least two random ones of the plurality of slaved stations and only over the common medium, a bit of a binary data message during an initial portion of a bit time interval;

(b) simultaneously detecting at the master station either of the binary states transmitted by any of the transmitting slaved stations during the initial portion of the bit time interval;

(c) selecting one of the received binary states;

(d) transmitting only over the common medium from the master station to all of the plurality of slaved stations during a response portion, subsequent to the initial portion, of the bit time interval, an echo of the binary state selected in step (c);

(e) causing each of the previously-transmitting slaved stations not receiving an echo of the binary state previously-transmitted by that slaved station to cease furher transmission of its present message;

(f) allowing only those of the previously-transmitting slaved stations receiving an echo of the binary state transmitted by that slaved station in the initial portion of that bit time interval to transmit in an initial portion of a nextsubsequent bit time interval the binary state of a nextsubsequent bit of the present message at that allowed slaved station; and

(g) repeating steps (a) through (f) until only one slaved station is transmitting.

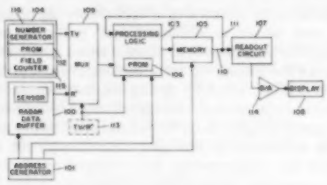
4,434,422
DIGITAL SCAN CONVERTER WITH RANDOMIZED DECAY FUNCTION

Claude J. Kenol, Long Island City, N.Y., and Richard M. DeGeorge, Pullach, Fed. Rep. of Germany, assignors to Hazeltine Corporation, Commack, N.Y.

Filed Apr. 15, 1981, Ser. No. 254,363

Int. Cl.³ G01S 7/44

U.S. Cl. 343—5 SC **11 Claims**



5. A digital scan converter for displaying, on a raster scan display, video data provided in a plan position indicator (PPI) format by a PPI sensor, said converter comprising:

(a) first means for storing said video data;

(b) a random-access memory (RAM);

(c) second means for generating addresses as a function of the scan pattern and scanning rate of the PPI sensor to accommodate the data stored by said first means at locations of said RAM corresponding to the display pattern to be realized on the raster scan display;

(d) third means for reading out the data stored in said RAM, for presentation on the raster scan display;

(e) generating means for pseudo-randomly selecting data being read-out by the third means; and

(f) processing logic means for transferring the data stored by the first means into said RAM and for modifying data selected by the generating means and writing said modified data back into the RAM at the memory address of the original read-out data.

4,434,423
DOPPLER VOR

Werner Kautz, Korntal, Fed. Rep. of Germany, assignor to International Standard Elektric Corporation, New York, N.Y.

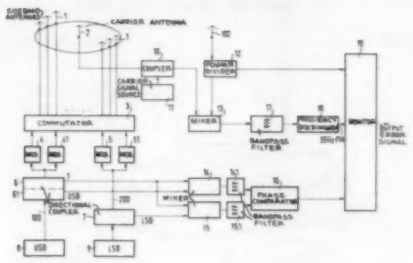
Filed Mar. 8, 1982, Ser. No. 355,514

Claims priority, application Fed. Rep. of Germany, Mar. 10, 1981, 3108980

Int. Cl.³ G01S 1/44

U.S. Cl. 343—406 **9 Claims**

1. A Doppler VOR system comprising a circular array of sideband antennas and a carrier antenna located at the center of said circle, wherein the upper sideband signal and the lower sideband signal are applied from separate sideband-signal sources to said sideband antennas seriatim through a commutator, and wherein a monitoring facility is provided for monitoring the radiated signals, comprising a first directional coupler (61) connected to couple out a small part of said upper sideband signal (USB) and passes it to a first mixer (14); a second directional coupler (7) connected to couple out a small part of said lower sideband signal (LSB) and pass it to a second mixer (15); at least one additional directional coupler (6) for coupling the carrier signal (T) intercepted by a sideband antenna (1) out of a feeder (100) for one of said sideband signals, said carrier signal being applied to said first and second mixers; a phase



comparator (16) responsive to the outputs of said mixers to determine the phase difference between said mixer outputs, and comparison means for evaluating the phase relationships among said sidebands and said carrier for developing an error signal indicative of deviation of the symmetrical phase relationship between said carrier and sidebands.

4,434,424
SIDE LOBE CANCELLER FOR RADAR SYSTEMS

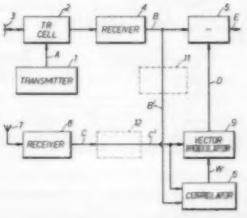
Julian C. Old, Chelmsford, England, assignor to The Marconi Company Limited, Chelmsford, England

Filed Dec. 14, 1981, Ser. No. 330,454

Claims priority, application United Kingdom, Dec. 15, 1980, 8039612

Int. Cl.³ G01S 3/16, 3/28

U.S. Cl. 343—381 **2 Claims**

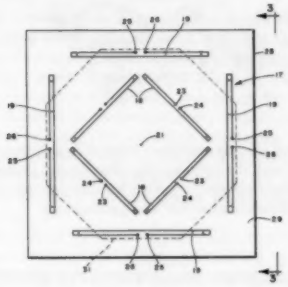


1. A radar receiver comprising a main channel arranged to process signals received by a directional antenna; an auxilliary channel arranged to process signals received by a relatively non-directional antenna; and a cancelling circuit connected to receive signals from both channels, to produce therefrom a correction signal and to apply the correction signal to the main channel, the correction signal being such as to cancel from the main channel components also present in the auxilliary channel; characterised in that the cancelling circuit is arranged to receive signals from the main channel via a moving target discriminator.

4,434,425
MULTIPLE RING DIPOLE ARRAY

Normand Barbano, Sunnyvale, Calif., assignor to GTE Products Corporation, Stamford, Conn.

Filed Feb. 2, 1982, Ser. No. 345,269
Int. Cl.³ H01Q *21/26*
U.S. Cl. 343—797 **8 Claims**

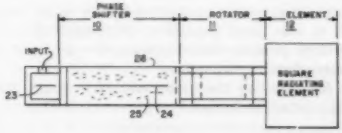


1. An antenna array comprising
a plurality of concentric sets of coplanar dipole elements,
each of said sets having opposed pairs of said elements with the elements of each set pair being equally spaced and parallel to each other and perpendicular to the elements of the other pair of the same set,
the lengths of and spacing between parallel elements in one set being less than the lengths of and spacing between parallel elements in the adjacent set,
each element in said one set extending in a direction transversely of the elements in the adjacent set,
means to support said elements in a common plane, and
means to feed said elements.

4,434,426
PHASED ARRAY ELEMENT WITH POLARIZATION CONTROL

Stanley Gaglione, New Hyde Park, and James A. O'Hare, Seacliff, both of N.Y., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 11, 1982, Ser. No. 338,702
Int. Cl.³ H01Q *3/26*
U.S. Cl. 343—372 **1 Claim**

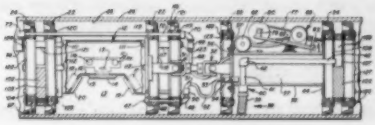


1. A radiating system having a polarization rotator comprising a waveguide with an input and an output; ferrite material inside a portion of said waveguide; control windings wound around said portion of said waveguide; an electronic driver unit connected to said control windings so as to initially drive the actual magnetic state of the ferrite material to a demagnetized state so as to act as a reference state; said unit then supplying said control windings so as to drive the magnetization of said ferrite material from said reference state to a predetermined magnetization amount; a ceramic transformer; a lineal polarized signal being fed to the input of said waveguide by way of said ceramic transformer; a mode suppressor provided in said transformer; said polarized signal being rotated in accordance with the magnetic state of said ferrite material and presented at the output of said waveguide; a phase shifter connected between the ceramic transformer and the input of said waveguide; a switching yoke positioned about said ferrite material; and a square radiating element connected to the output of said waveguide.

4,434,427
ATMOSPHERE CONTROL FOR PHOTOGRAPHIC PIPELINE INSPECTION

Frederick Clarke, Houston, Tex.; Donald E. Lorenzi, Des Plaines, Ill., and Edward F. Schaefer, Tulsa, Okla., assignors to Magnaflux Corporation, Chicago, Ill.

Filed Jan. 5, 1982, Ser. No. 337,117
Int. Cl.³ G03B *37/00*; G01D *9/38*
U.S. Cl. 346—33 P **18 Claims**



1. A pipe inspection device arranged for longitudinal movement within a generally horizontal pipe and comprising: a frame structure, a plurality of longitudinally spaced resilient cup means on said frame structure having annular peripheral portions for sliding engagement with longitudinally spaced internal surface portions of the pipe to support said device for movement within the pipe, weight means on said frame structure providing a center of gravity spaced radially outwardly from a central longitudinal axis for gravitationally placing said frame structure at a certain angular position when moved through a horizontal pipe, photographic camera means disposed on said frame structure in a camera space behind a first one of said cup means and in front of a second one of said cup means, said camera means including means defining an image area, film storage and transport means arranged for feeding film through said image area and optical means for projecting an image to said image area along an axis which is substantially vertical when said frame structure is at said certain angular position and for producing an image in said image area corresponding to an upwardly facing internal lower surface area of a horizontal pipe, illumination means for illuminating said surface area, liquid flow control means for operating during movement through any accumulation of liquid in the pipe to effect upward movement of the liquid, said liquid flow control means and said plurality of cup means cooperating to allow said device to pass under the major portion of the liquid of any such accumulation and to produce no more than a thin film of liquid over said lower internal surface area within said camera space, means defining a flow path for flow of a gaseous medium within the pipe from a region outside said camera chamber to said camera space, and means defining a chamber in said flow path filled with a moisture-removing material for producing a supply of dry gas to said camera space at a rate such as to produce a clear atmosphere therein.

4,434,428
DEFLECTION DETECTOR FOR INK JET PRINTING APPARATUS

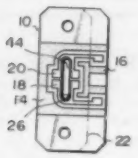
Masanori Horike, and Yutaka Ebi, both of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Jun. 1, 1982, Ser. No. 384,133
Claims priority, application Japan, Jun. 8, 1981, 56-87955
Int. Cl.³ G01D *15/18, 18/00*
U.S. Cl. 346—75 **10 Claims**

1. A deflection detector for an ink jet printing apparatus, comprising:
a first layer of an insulating material which carries on one

surface thereof at least two flat and thin separate detection electrodes, and

a second layer of an insulating material which is engaged with said detection electrodes at one surface thereof,



said first and second insulator layers being formed with aligned slots which extend throughout the insulator layers and the detection electrodes to allow ink droplets to pass therethrough.

4,434,429

INFORMATION RECORDING MEMBER AND METHOD OF FABRICATING THE SAME

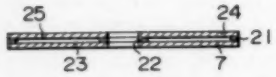
Motoyasu Terao, Tokyo; Shinkichi Horigome, Tachikawa; Munehisa Mitsuya, Hachioji; Sakae Ota, Yokohama, and Kazuo Shigematsu, Kawasaki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 15, 1981, Ser. No. 311,888

Claims priority, application Japan, Oct. 15, 1980, 55-142911

Int. Cl.³ G01G *15/34*; G01D *15/10*

U.S. Cl. 346—135.1 **40 Claims**



1. An information recording member comprising:

a substrate; and

a thin film formed on said substrate with or without an intermediate layer therebetween, said thin film being irradiated with a recording beam to make an aperture or recess in said thin film, said thin film being a thin crystalline film, said thin crystalline film having a composition expressed by a general formula $Se_xTe_yM_z$, where x, y and z are given by the formulae $0.02 \leqq x \leqq 0.35$, $0.50 \leqq y \leqq 0.98$ and $0 \leqq z \leqq 0.45$, respectively, and M indicates at least one element selected from the group consisting of Sb, Bi, S, Si, Ge, Sn, Pb, Al, Ga, In, Tl, Zn, Cd, Au, Ag, Cu, Ni, Pd, Rh, Cr, Mo, W, and Ta, whereby oxidation of Te is sufficiently decreased, as compared with a thin film not containing Se_x, to provide a recording member having good stability.

4,434,430

INK JET PRINTER HEAD

Haruhiko Koto, Shiojiri, Japan, assignor to Epson Corporation, Nagano and Kabushiki Kaisha Suwa Seikosha, Tokyo, both of, Japan

Continuation-in-part of Ser. No. 189,461, Sep. 22, 1980, Pat. No. 4,364,066. This application May 28, 1982, Ser. No. 383,368

Claims priority, application Japan, Sep. 21, 1979, 54-121621

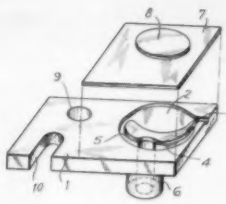
Int. Cl.³ G01D *15/18*

U.S. Cl. 346—140 R **26 Claims**

6. An ink jet printer head for a printer for ejecting liquid ink onto a recording medium, comprising:

a first substrate having a substantially planar surface and a second substrate having a cooperating substantially planar surface, the planar surfaces cooperating to define at least one nozzle, pressure chamber and passageway therebetween; and

a piezoelectric element bonded to one of the first and second substrates,



said first and second substrates formed from a thermoplastic material with the cooperating substantially planar surfaces permanently coupled together for forming the at least one nozzle, pressure chamber and passageway.

4,434,431

MULTILEVEL IMAGE PRINTING DEVICE

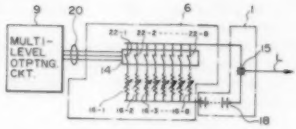
Tetsuo Ohkubo; Yoshio Arai, and Hiroyuki Kataoka, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Kanagawa, Japan

Filed Jun. 10, 1981, Ser. No. 272,232

Claims priority, application Japan, Jun. 13, 1980, 55-79053

Int. Cl.³ G01D *15/14*

U.S. Cl. 346—154 **8 Claims**



1. A multilevel image printing device comprising:

a multilevel image outputting circuit for outputting a digital image signal indicative of a specific density level of said image, said specific density level being one of at least three possible discrete density levels;

a multilevel image signal to laser beam conversion circuit for converting said digital image signal into a laser beam having a specific intensity level corresponding to said specific density level of said image;

a laser beam source driven by said multilevel image signal to laser beam conversion circuit;

said laser beam source outputting a laser beam modulated with at least three gradations corresponding to said at least three possible discrete density levels of said image;

a photoconductive surface; and

means for scanning the modulated laser beam onto said photoconductive surface.

4,434,432

UNIVERSAL IMAGE CODER AND CONTROLLER FOR MULTICOLOR ELECTROLYTIC PRINTING

Jack R. Dailey, Endicott; Harry C. Kuntzleman, Newark Valley, both of N.Y.; Charles S. Ng, Charlotte, N.C., and John W. Pike, Endwell, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 24, 1982, Ser. No. 391,777

Int. Cl.³ G01D *15/06*

U.S. Cl. 346—154 **14 Claims**

1. Apparatus for controlling a plurality of output nodes by selectively providing at each output node, one of a number of predetermined unique pulses in response to the receipt of information from an external source defining the desired state of

each output node at a particular instant of time, each of said pulses being one in an matrix thereof, said matrix having a predetermined number of amplitude and duration increments, said control apparatus comprising:

(a) bus means, connected to receive the output of said source, for conveying input information on the desired state of said output nodes from said source to said control apparatus;

(b) code expansion means, connected to said bus means, for expanding information received from said bus means into a local format of m coded words of k bits each, there being one such word for each output node, each of said words being formed of bit groups, one group for each of said pulse duration increments, said bits of each group defining any one of said pulse amplitude increments;

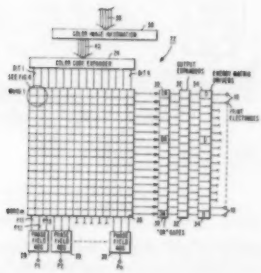
(c) storage means having a plurality of accessible cells, connected to said code expansion means, for receiving and storing therein all of said coded words, one bit of each word per cell;

(d) a plurality of scanning register means, one for each duration increment of said pulses, each having a predefined bit pattern stored therein and connected, respectively, one to each and the same group of storage means cells for each of said words stored therein, for scanning said storage means cells with said predefined bit pattern;

(e) logic circuit means connected to receive the output of said storage means cells for logically comparing the bits stored therein to said bit patterns of said scanning register means and for producing an output that is a logical combination of each storage cell bit and the corresponding bit of said predefined scanning register bit pattern;

(f) output node circuit means, connected between said logic circuit means and said output nodes, for receiving the output of said logic circuit means and for responsively converting said output to the appropriate amplitude increment for each of said output nodes; and

(g) timing circuit means connected to said bus means, said code expansion means, said storage means and said scanning register means for causing said bus means to shift said external source information into said code expansion means, for causing said expanded local coded words to be shifted from said code expansion means to said storage means and for causing said scanning register means to sequentially scan, by group, said cells of said storage means with which they are associated.



4,434,433

ENHANCEMENT MODE JFET DYNAMIC MEMORY

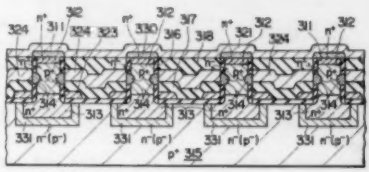
Jun-ichi Nishizawa, Sendai, Japan, assignor to Zaidan Hojin Handotai Kenkyu Shinkokai, Miyagi, Japan

Continuation of Ser. No. 878,441, Feb. 16, 1978, abandoned. This application Aug. 4, 1980, Ser. No. 174,724

Claims priority, application Japan, Feb. 21, 1977, 52-18465; Feb. 26, 1977, 52-20653; Mar. 30, 1977, 52-35956; Mar. 31, 1977, 52-36304; Apr. 2, 1977, 52-37905; Jul. 11, 1977, 52-83226

Int. Cl.³ H01L *27/10, 27/12, 29/80;* **G11C** *11/40*

U.S. Cl. 357—22 **2 Claims**



1. A semiconductor memory cell device formed in a semiconductor body and including at least one memory cell which comprises:

a first semiconductor region of a first conductivity type having a low resistivity;

a second semiconductor region of a second conductivity type opposite to said first conductivity type surrounding at least a portion of said first semiconductor region;

a third semiconductor region of said first conductivity type having a high resistivity and disposed on said first semiconductor region,

a fourth semiconductor region of said first conductivity type having a low resistivity and disposed on said third semiconductor region,

gate means disposed adjacent to said third semiconductor region between said first and fourth semiconductor regions for controlling the potential distribution in said third semiconductor region;

an insulating layer formed on said fourth semiconductor region;

a conductive electrode formed on said insulating layer,

said fourth semiconductor region, said insulating layer and said conductive electrode forming a capacitor;

means for conducting being electrically connected to said first semiconductor region,

said third semiconductor region having such impurity doping characteristics and dimensions that enable said potential distribution to form a potential barrier for charge carriers transporting between said first and fourth semiconductor regions by the influence of said gate means and that render the height of said potential barrier which approaches pinch-off to be controllable also by the voltage between said first and fourth semiconductor regions,

said semiconductor body having at least one recessed portion adjacent to said third semiconductor region, and said gate means is at least partially formed in said recess,

said memory cell device further comprising: an insulating region filling said recess,

said conducting means including a fifth semiconductor region of said first conductivity type and of a low resistivity, and a metallic region embedded in said insulating region in said recess at least partially contacting said fifth semiconductor region;

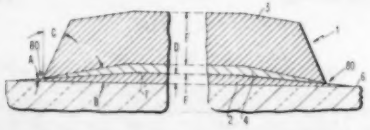
one of said first region and said fourth region being provided in a surface of said semiconductor body, and the other being provided within said semiconductor body in a substantially vertical position relative to said surface of the semiconductor body.

4,434,434

SOLDER MOUND FORMATION ON SUBSTRATES

Somnath Bhattacharya, Wappingers Falls; Shih-Ming Hu; Nicholas G. Koopman, both of Hopewell Junction, and Chester C. Oldakowski, Poughkeepsie, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 30, 1981, Ser. No. 249,261
Int. Cl.³ H01L 23/48, 29/44, 29/52, 29/62
U.S. Cl. 357—71 12 Claims



1. Solder support pads for brittle coatings of substrates comprising:

a first layer of chromium on said coating with outwardly tapered wedge-shaped peripheral portions;

a second concentric layer of an admixture of chromium and copper over and concentric with said first layer, said second layer having outwardly tapered wedge-shaped peripheral portions defining a perimeter disposed in inward spaced relationship relative to the perimeter of said first layer to leave an annular ring of said first layer adjacent the perimeter thereof; and

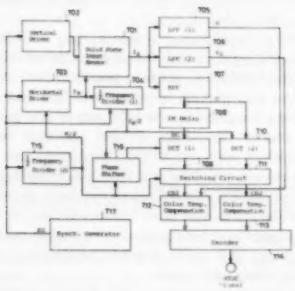
a third layer of copper over and concentric with said second layer, said third layer outwardly tapered wedge-shaped peripheral portions with the perimeter thereof in substantially coincident relationship with the perimeter of said second layer.

4,434,435

SOLID STATE COLOR IMAGING APPARATUS

Makoto Fujimoto, Takatsuki, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Nov. 18, 1981, Ser. No. 322,692
Claims priority, application Japan, Nov. 20, 1980, 55-163880; Feb. 20, 1981, 56-24420; May 14, 1981, 56-73071
Int. Cl.³ H04N 9/07
U.S. Cl. 358—44 21 Claims



1. A solid state color imaging apparatus comprising:

a solid state image sensor comprising a plurality of picture elements regularly disposed in two dimensional patterns, the disposition comprising a plurality of horizontal lines, each having a plurality of picture elements disposed in repetition at a predetermined pitch,

a color filter comprising a plurality of substantially parallel stripes of color filter elements, said row having repetition of stripes of a predetermined number of color filter elements,

characterized in that

spatial relations between the phases of repetition of the picture elements in the horizontal lines and the phases of repetition of stripes of the color filters are changed for different horizontal lines which are scanned in sequence, wherein said phases of the repetition of the picture elements in the horizontal lines are changed for every horizontal lines which are scanned in sequence, and

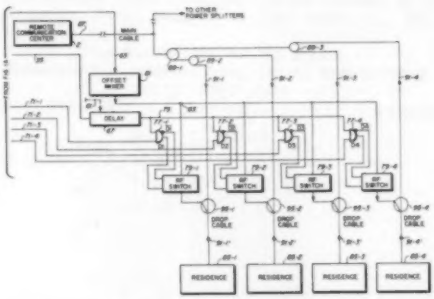
wherein said change of phase per one horizontal line is substantially 90°.

4,434,436

ADDRESSABLE PREMIUM CHANNEL OBFUSCATION DEVICE FOR CABLE TELEVISION SYSTEMS

Gayheart C. Kleykamp, Ahwatukee; Sam Goldwater, and Charles L. Salsbery, both of Phoenix, all of Ariz., assignors to Bruce Merrill, Scottsdale, Ariz.

Filed Jul. 13, 1981, Ser. No. 282,930
Int. Cl.³ H04N 7/16; H04K 1/02
U.S. Cl. 358—118 23 Claims



1. A method of preventing piracy of television programs supplied by a cable television system including a communication center applying to a main cable a plurality of program signals each having a frequency range within a respective one of a plurality of respective channels, various residences being authorized to receive various ones of the programs represented by said program signals, said cable television system also including a plurality of drop cables coupled to said main cable for delivering said program signals to said residences, said method comprising the steps of:

(a) loading an addressable memory with a plurality of channel status bits, each of said channel status bits having a state that represents the authorization or non-authorization of a particular one of said residences to view a program on a particular one of said channels;

(b) selecting an obfuscation signal frequency that is within a selected one of said channels, said obfuscation signal frequency being one of a plurality of obfuscation frequencies that are within respective ones of said channel frequency ranges, said memory having a plurality of addressable locations each corresponding to a respective one of said obfuscation signal frequencies, each of said addressable locations containing a plurality of said channel status bits respectively representing the authorization or non-authorization of respective ones of said residences to view the programs on respective ones of said channels;

(c) generating an obfuscation signal having a carrier frequency equal to the obfuscation signal frequency selected in accordance with step (b);

(d) addressing the location of said memory corresponding to said obfuscation signal frequency selected in accordance with step (b) to obtain the channel status bits therefrom;

(e) superimposing said obfuscation signal of step (c) onto the

program signals conducted by the ones of said drop cables coupled to television sets in the ones of said residences indicated by the channel status bits obtained in step (d) to be not authorized to view the program represented by the program signals of the channel in which the obfuscation signal frequency selected in accordance with step (b) lies; and

(f) repeating steps (b) through (e) for another of said channels.

4,434,437
GENERATING ANGULAR COORDINATE OF RASTER SCAN OF POLAR-COORDINATE ADDRESSED MEMORY

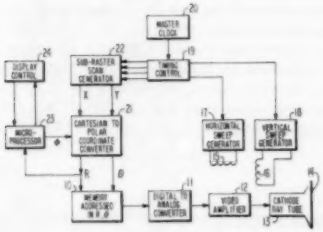
Christopher H. Strolle, Philadelphia, Pa., and Terrence R. Smith, Clementon, N.J., assignors to RCA Corporation, New York, N.Y.

Filed Aug. 31, 1981, Ser. No. 298,269

Claims priority, application United Kingdom, Jan. 26, 1981, 8102281

Int. Cl.³ H04N *5/02*

U.S. Cl. 358—140 **10 Claims**



1. Scan conversion apparatus comprising: means for parallelly supplying streams of first and second binary numbers descriptive of raster scanning in first and second orthogonal Cartesian coordinates, the first coordinates describing pixel positions along scan lines and the second coordinates describing scan line positions in the field of raster scan;

means for generating pairs of logarithms, each logarithm in a pair being generated responsive to a respective one of the first and second binary numbers appearing in said parallely supplied streams at successive times;

means linearly combining the logarithms in each of said pairs of logarithms as they are generated, for generating the difference of the logarithms of concurrently supplied first and second binary numbers; and

first read-only memory means responsive to said differences for supplying binary numbers descriptive of raster scan in terms of angular position from a reference position in said raster scan.

4,434,438
LOW COST AUTOMATIC EQUALIZER

Theodore S. Rzeszewski, Lombard, Ill., assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

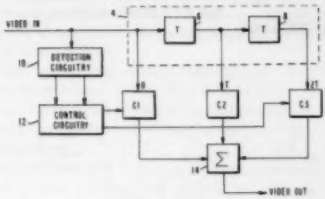
Filed Jul. 10, 1981, Ser. No. 282,039

Int. Cl.³ H04N *5/44*

U.S. Cl. 358—167 **10 Claims**

1. In a transversal filter having a delay line which receives a signal, said delay line having first, second and third successive delay line taps providing first, second and third tap signals, respectively; a control apparatus comprising:

first means (i) for adjusting the amplitudes of said first and third tap signals equally and (ii) for adjusting the polarity of said first and third tap signals oppositely to thereby provide phase equalization of said received signal; and



second means for adjusting the amplitudes and polarities of said first and said third tap signals equally to thereby provide amplitude equalization of said received signal.

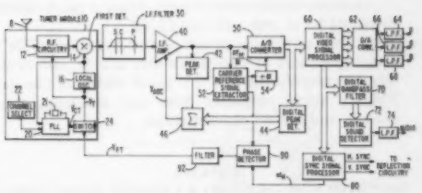
4,434,439
DIGITAL TELEVISION AGC ARRANGEMENT

Steven A. Steckler, Clark, and Alvin R. Balaban, Lebanon, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Feb. 22, 1982, Ser. No. 350,580

Int. Cl.³ H04N *5/52*

U.S. Cl. 358—174 **10 Claims**



1. In a signal processing system, including a source of analog signals including a synchronizing signal component, apparatus comprising:

an analog signal amplifier having a first input coupled to receive said analog signals, a signal output, and a gain control signal input for receiving a gain control signal to control the gain of said amplifier;

an analog-to-digital converter having an input coupled to the output of said analog signal amplifier, and an output at which digital signal samples are produced;

an analog amplitude detector circuit having an input coupled to receive the signal applied to the input of said analog-to-digital converter and an output at which a first signal representative of the amplitude of the analog signal applied to the input of said analog-to-digital converter is produced;

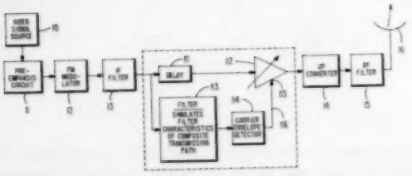
a digital amplitude detector circuit having an input coupled to the output of said analog-to-digital converter and an output at which a second signal representative of the amplitude of the synchronizing signal component of the digital signal samples produced by said analog-to-digital converter is produced; and

combining means having a first input coupled to the output of said analog amplitude detector circuit, a second input coupled to the output of said digital amplitude detector circuit, and an output coupled to said gain control signal input of said analog signal amplifier, for combining said first and second signals to produce said gain control signal.

4,434,440
FM/TV TRANSMISSION SYSTEM

Leonard N. Schiff, Lawrenceville, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 24, 1981, Ser. No. 324,585
Int. Cl.³ H04N *5/38*
U.S. Cl. 358—186 **7 Claims**



1. In a frequency modulated television (FM/TV) transmitter for transmitting an FM/TV signal over a transmission path having certain bandpass characteristics to at least one receiver having a demodulator, an improved automatic gain control (AGC) system at said transmitter and comprising:

simulating means responsive to said FM/TV signal generated at said transmitter for simulating the bandpass characteristics of said transmission path to produce a simulated FM/TV signal as it would appear at said receiver in the absence of an AGC system;

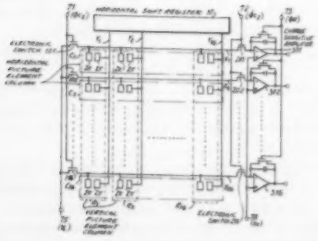
means responsive to said simulated FM/TV signal to produce a control signal when said FM/TV signal exhibits certain characteristics which will cause the input signal to the receiver demodulator to drop below a predetermined threshold level; and

variable gain amplifying means responsive to said FM/TV signal generated at said transmitter and to said control signal to amplify said FM/TV signal when said simulated FM/TV signal outputted from said simulating means exhibits said certain characteristics.

4,434,441
METHOD FOR DRIVING A CHARGE INJECTION DEVICE

Hiroyuki Ishizaki, Akashi; Yoshiki Tsujino, Kakogawa, and Masaji Dohi, Kobe, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Nov. 23, 1981, Ser. No. 324,070
Claims priority, application Japan, Nov. 27, 1980, 55-167828
Int. Cl.³ H04N *3/14*
U.S. Cl. 358—213 **6 Claims**



1. A method for driving a charge injection device having picture elements, each consisting of a storing electrode and a detecting electrode, arranged in the form of a matrix on a semiconductor substrate, the storing electrodes of the picture elements being connected in common for each column or row and the detecting electrodes being connected in common for each row or column, said charge injection device having a basic operation sequence essentially containing each operation of charge storing, readout and injection, said method comprising the steps of sequentially

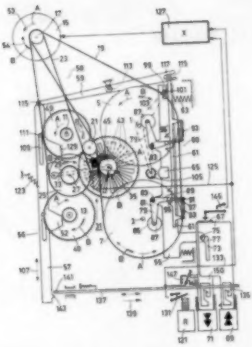
applying the basic operation sequence for each picture element which is considered as the readout unit with a constant time delay; and

inserting the specified charge holding period between the readout period and the injection period.

4,434,442
AUTOMATIC REVERSE SYSTEM FOR TAPE RECORDER

Klaus Kommoss, Wetzlar-Naunheim, and Heinz Schütte, Wetzlar, Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 19, 1981, Ser. No. 294,265
Claims priority, application Fed. Rep. of Germany, Aug. 30, 1980, 3032807
Int. Cl.³ G11B *15/14*
U.S. Cl. 360—74.2 **13 Claims**



1. An automatic reversing drive system for a tape recorder, comprising

a drive motor,

two winding mandrels for tape reels, and a respective winding gear associated with each mandrel,

a pivotal transmission whose pivotal position is dependent on the direction of rotation of said motor, arranged for alternately engaging one or the other of said mandrel winding gears for driving the mandrel by the drive motor,

two driven capstans for respective transport of tape in one direction or the opposite direction,

at least one pivotal lever,

a control plate having two fixed end positions arranged for pivoting said lever,

a pressure roller arranged responsive to pivoting of said lever for selective engagement with one of said capstans for driving the tape in one direction of tape movement, and

a pressure roller arranged for alternate engagement with the other capstan for driving the tape in the opposite direction of tape movement,

characterized in that said control plate is linearly movable between said end positions and comprises a respective switching portion associated with each winding gear, arranged such that during reversal of direction of motor rotation and associated pivotal movement of the transmission, during which reversal the previously driven winding gear is stopped and the previously stationary winding gear is set in motion, said control plate is shifted by the winding gear which has been set in motion, and

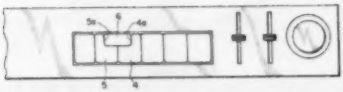
said system comprises means for pivoting said at least one lever in response to shifting of the control plate arranged so that the pressure roller associated with the capstan for

tape movement in the direction of the winding gear set in motion is positioned against that capstan, and the other pressure roller is pivoted away from the other capstan.

4,434,443
TAPE RECORDER

Kobun Yoshida, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jul. 24, 1981, Ser. No. 286,488
Claims priority, application Japan, Jul. 25, 1980, 55-101318
Int. Cl.³ G11B *15/48*
U.S. Cl. 360—74.4 **7 Claims**

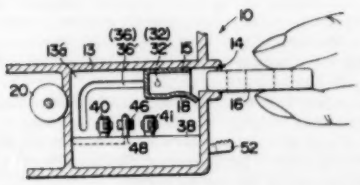


1. A tape recorder comprising: a fast-forward button; a rewind button; an inter-music detector activating button arranged immediately adjacent to both said fast-forward button and said rewind button, wherein both said inter-music detector activating button and a selected one of said fast-forward button and said rewind button are actuatable simultaneously with one finger; and means for locking an inter-music detector activating function of said inter-music detector activating button upon actuation of one of said fast-forward button and said rewind button and for releasing said inter-music detector function upon release of said one of said fast-forward button and said rewind button.

4,434,444
TAPE CASSETTE LOADING DEVICE FOR CASSETTE TAPE RECORDER

Masaaki Sato, Hachioji, Japan, assignor to Olympus Optical Company Ltd., Tokyo, Japan

Filed Dec. 29, 1980, Ser. No. 220,729
Claims priority, application Japan, Feb. 8, 1980, 55-14315; Feb. 8, 1980, 55-14316; Feb. 8, 1980, 55-14317
Int. Cl.³ G11B *15/18, 15/66*
U.S. Cl. 360—96.5 **16 Claims**

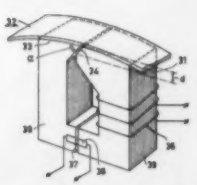


1. A tape cassette loading device comprising:
a cassette holder for receiving and retaining a tape cassette and movable between a first position in which the cassette is inserted into the cassette holder and a second position in which the cassette is in operative engagement with a tape drive;
a holder drive mechanism and first means (32) for connecting said holder drive mechanism to said cassette holder for moving it between said first position and said second position;
a brushless motor including a rotary shaft and second means for connecting said motor and rotary shaft to said holder drive mechanism for driving same, said motor being capable of initiating rotation in response to an external starting drive applied to said rotary shaft and being capable of stopping in response to an external braking effort being applied to said rotary shaft;
said cassette holder being movable from said first position toward said second position upon receipt of said tape cassette and said first connecting means transmitting said movement to said holder drive mechanism to develop said external starting drive;
said second connecting means transmitting said external starting drive to said rotary shaft and motor;
said motor and said holder drive mechanism cooperating to complete the movement of said cassette holder to said second position;
means for stopping said holder drive mechanism when said cassette holder reaches said second position and being effective to apply a braking efort to said rotary shaft of said motor to stop said motor;
means for moving said cassette holder from said second position toward said first position for imparting said external starting drive in the form of a mechanical force to rotate said rotary shaft and thereby actuate said motor; and
said motor and drive mechanism cooperating to complete the movement of said cassette holder to said first position.

4,434,445
MAGNETIC HEAD FOR HIGH TRACK DENSITY

Alfred Van Herk, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 2, 1981, Ser. No. 317,105
Claims priority, application Netherlands, Nov. 13, 1980, 8006193
Int. Cl.³ G11B *5/25*
U.S. Cl. 360—121 **2 Claims**



1. A magnetic head (31) for writing and/or reading information in parallel tracks on a magnetic recording medium (32) with high track density, comprising a magnetic core which includes two oppositely located parts (38, 39) enclosing a transducing gap (34) between them, around which core an electric winding (35) is provided, the head (31) further comprising means for reducing side fringing effects, characterized in that the reducing means includes the gap having a depth d which is of the order of magnitude of the longest wavelength on the recording medium (32), and also having a slope α oriented relative to the surface (33) facing the recording medium (32) such that $\alpha \leqq 45°$.

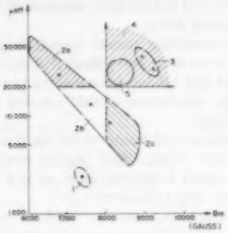
4,434,446
MAGNETIC HEAD

Naohiko Toshimitsu, Saitama, Japan, assignor to Canon Kabushiki Kaisha and Canon Denshi Kabushiki Kaisha, both of Saitama, Japan

Continuation of Ser. No. 156,216, Jun. 3, 1980, abandoned. This application Jun. 28, 1982, Ser. No. 392,758
Claims priority, application Japan, Jun. 11, 1979, 54-73647
Int. Cl.³ G11B *5/12*
U.S. Cl. 360—125 **4 Claims**

1. A magnetic head, comprising:
a first core half made of high hardness permalloy having magnetic flux density of at least 8,000 gauses;
a second core half disposed with respect to said first core

half at the side where a recording medium in motion enters said magnetic head, said second core half being made of high hardness permalloy having magnetic permeability of at least 20,000; and



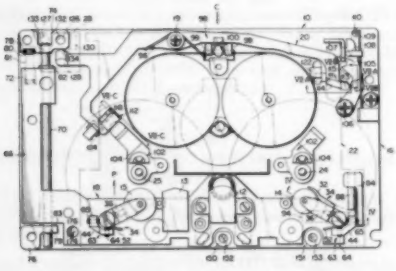
a winding wound around at least a portion of at least one of said core halves.

4,434,447

CASSETTE TAPE RECORDER

Akira Osanai, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Sep. 16, 1981, Ser. No. 302,811
Claims priority, application Japan, Sep. 25, 1980, 55-133165
Int. Cl.³ G11B *00/00, 15/04*
U.S. Cl. 360—137 **10 Claims**



1. In a cassette tape recorder comprising a kangaroo pocket type cassette holder for receiving a cassette having an erroneous erasure preventing lug which is removable to produce a hole in the cassette, the cassette holder being movable between an inserted position and an eject position; an eject lever rotatably mounted on a base board and which is rotatable to an eject mode to eject a cassette from the tape recorder; and an erroneous erasure preventing lever provided with a feeler member insertible into a hole in a cassette produced by the removal of the erroneous erasure preventing lug of the cassette, said erroneous erasure preventing lever being rotatably mounted on the base board;

the improvement wherein:

said cassette holder is integrally provided with at least one engagement member; and

said eject lever is a multi-function eject lever which includes a single eject lever having at least two of the following three members integrally formed thereon:

at least one guide pin member integrally formed on said single eject lever for pushing a cassette toward the heads of the tape recorder by engagement with a corresponding guide hole formed in the cassette holder;

at least one lock member integrally formed on said single eject lever and engageable with said at least one engagement member of the cassette holder to lock the cassette holder in an inserted position when the cassette holder is moved to the inserted position from an eject position; and

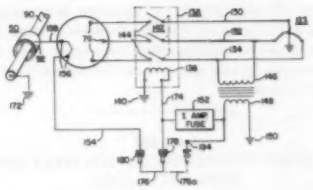
a cam integrally formed on said single eject lever and which, when the feeler member of the erroneous erasure preventing lever is inserted into said hole in the cassette which is produced by the removal of the erroneous erasure preventing lug, and when the single eject lever is rotated for the eject mode, is pressed against the erroneous erasure preventing lever to cause rotation of the erroneous erasure preventing lever in such a direction as to cause removal of the feeler member from said hole in the cassette which is produced by the removal of the erroneous erasure preventing lug, thereby permitting free removal of the cassette from the cassette holder.

4,434,448

NON-CONTAMINATING TRANSFORMER OIL PUMP, STATIC ARRESTER, AND CONTROL CIRCUIT

Clifford J. Bell, Mt. Pleasant Township, Delaware County, and Ramsis S. Girgis, Muncie, both of Ind., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 19, 1982, Ser. No. 399,507
Int. Cl.³ H02H *7/08*
U.S. Cl. 361—23 **10 Claims**



1. A motor-pump unit for circulating a fluid, comprising:

(a) a housing having a motor portion and a pump portion including a motor and a pump respectively;

(b) a rotatable, electrically conductive shaft extending between the motor and the pump;

(c) first and second sleeve bearings mounted on the shaft for rotation in the housing;

(d) each bearing having a sleeve surface disposed radially adjacent to and in contact with the periphery of the shaft;

(e) at least one of the bearings including the bearing constructed of non-electrically conductive material including a recess in the surface thereof;

(f) detecting means for detecting bearing wear including an electrically conductive contact ring in the recess to effect an electrical connection between the contact ring through the shaft upon a predetermined displacement of the shaft due to wear of the bearing sleeve;

(g) means electrically connecting the shaft to ground;

(h) a ground source of electrical energy at a predetermined voltage and including electrical conductor means leading to the motor;

(i) a circuit breaker in the electrical conductor means and comprising an actuating coil having a first end connected to ground and having another end;

(j) a circuit leading from the grounded source of electrical energy to the electrically conductive contact ring;

(k) the circuit including a circuit interrupter having a predetermined breakdown rating and including a branch conductor connected between the other end of the actuating coil and the downstream end of the circuit interrupter;

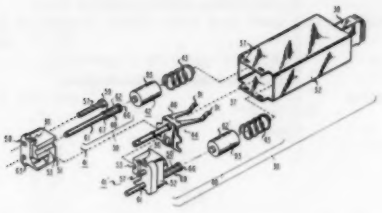
whereby static electricity buildup is prevented on the moving parts of the motor portions and pump portions and a trip circuit is provided for the motor portions.

4,434,449

PROTECTOR UNIT FOR TELECOMMUNICATIONS CIRCUITS

Larry W. Dickey, Hackettstown, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 28, 1982, Ser. No. 383,230
Int. Cl.³ H02H 9/06
U.S. Cl. 361—124 **4 Claims**



1. An electrical protector unit for protecting a circuit having first and second conductors against excessive current increases and voltage surges, said protector assembly comprises:

a dielectric housing for supporting the unit;

a grounding structure;

a dielectric base structure;

two input and two output conductive elements arranged in pairs and supported in said dielectric base structure;

first and second current responsive means for sensing said excessive current increases in said first and second conductors, respectively, and diverting said excessive current increases to said ground structure, said first and second current-responsive means being supported on said dielectric base structure, each current-responsive means including a resistance wire in direct electrical series with a pair of associated input and output conductive elements; and

means for conducting voltage surges in either of said conductors to said ground structure

characterized in that

said dielectric base structure consists of a first base half and a second base half, each base half supporting a pair of input and output conductive elements and one of said current responsive means, said first and second base halves held in mated position theretogether by said dielectric housing.

4,434,450

CONTROLLED FLUX CONTACTOR

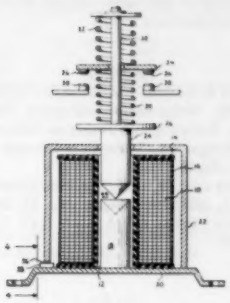
Ronald E. Gareis, Charlottesville, Va., assignor to General Electric Company, Salem, Va.

Filed Dec. 21, 1981, Ser. No. 332,731
Int. Cl.³ H01H 47/32
U.S. Cl. 361—152 **3 Claims**

1. In an electromagnetic contactor assembly of the type including an electrically energizable actuating coil for inducing magnetic flux in a magnetic core member, a contact carrying moveable armature forming a part of the flux path for the core member, the armature being moved between a first rest position and a second energized position upon energization of the coil with a force proportional to the magnitude of flux in the core member, the improvement comprising:

a Hall effect sensor for sensing the magnitude of flux in the core member and for producing a signal representative of said flux; and

electrical circuit means for energizing the actuating coil, said circuit means being responsive to said signal from said Hall effect sensor for varying the electrical energization of the coil in a manner to adjust the magnitude of flux in the core member to a predetermined value and incuding a controllable current source for connecting the actuating coil to a DC voltage source and a linear amplifier having a first input terminal connected for receiving said signal from said Hall effect sensor and a second output terminal connected for receiving a signal representative of said predetermined value of flux in the core member, said amplifier being connected for providing a signal to control



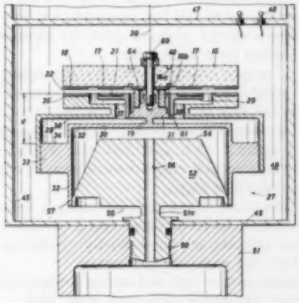
conduction of said current source in a manner tending to minimize any difference between said signal from said Hall effect sensor and said signal representative of said predetermined value of flux.

4,434,451

PRESSURE SENSORS

Leroy C. Delatorre, 10 Crestwood, Sugarland, Tex. 77478

Division of Ser. No. 89,162, Oct. 29, 1979, Pat. No. 4,322,775.
This application Aug. 3, 1981, Ser. No. 289,483
Int. Cl.³ H01G 7/00, 5/34
U.S. Cl. 361—283 **21 Claims**



14. A capacitor device for use in measuring pressure comprising:

housing means defining an enclosed pressure chamber wherein one wall of said chamber is a cylindrically shaped displaceable diaphragm having a central axis,

first support means attached to said one wall and aligned with said central axis,

said first support means including an upper support member,

at least two annular capacitor plate means disposed concentrically on said upper support member with respect to said central axis,

said first support means including a lower support member disposed between said upper support member and said one wall,

annular capacitor plate means disposed on said lower support member in a capacitance relationship to one of said annular capacitor plate means on said upper support member to define a reference capacitor means,

second support means attached to said housing means,

said second support means including a second support member disposed between said upper support member and said one wall,

annular capacitor plate means disposed on said second support member in a relationship to the other of said capacitor plate means on said upper support member to define a measurement capacitor means.

4,434,452

METALLIZED FILM CAPACITOR

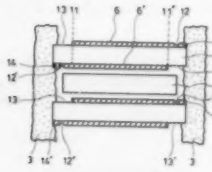
Takeshi Hamabe, Nishinomiya; Hidekazu Wada, Takaoka; Mikio Naruse, Takaoka, and Toshiyuki Nishimori, Takaoka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Jan. 15, 1981, Ser. No. 225,440

Claims priority, application Japan, Jan. 18, 1980, 55-4871

Int. Cl.³ H01G *1/015, 1/14, 1/17, 7/00*

U.S. Cl. 361—304 **12 Claims**



1. A metallized film capacitor comprising:

a number of first insulating foil film segments coated with metal layers on both surfaces thereof, said metal layers with a same pattern on same sides of said first insulating foil film segments constituting a first group of electrode segments electrically separated from each other, and said metal layers with another same pattern on the other sides of said same sides of said first insulating foil film segments constituting a second group of electrode segments electrically separated from each other,

a number of second insulating foil film segments, each one thereof being disposed between each one of said first insulating foil film segments in a stacked form, and

a first and a second metal contact layers respectively disposed in contact with said first and second electrode segment groups at side edges thereof forming a first fusing portion at said side edges,

said metal electrode layers each including a second fusing portion formed as an integral fusing portion extending along and adjacent and substantially parallel to said first and said second metal contact layers,

said first fusing portion and said second fusing portion forming a series connection with each other, and

at least one of said first fusing portion and said second fusing portion being electrically cut off, when dielectric breakdown occurs between respective pairs of confronting metal electrodes layers on said first insulating foil film segments, such that the breakdown electrically separates at least one metal electrode layer of one pair among said respective pairs of the confronting metal electrode layers from the respective electrode segment group among said first and said second electrode segment groups.

4,434,453

GLARE-ELIMINATING TASK LIGHTING FIXTURE

James Campbell, 50 Grove Street Extension, Sewickley, Pa. 15143

Filed Jun. 1, 1982, Ser. No. 384,651

Int. Cl.³ A61G *13/00*

U.S. Cl. 362—33 **19 Claims**

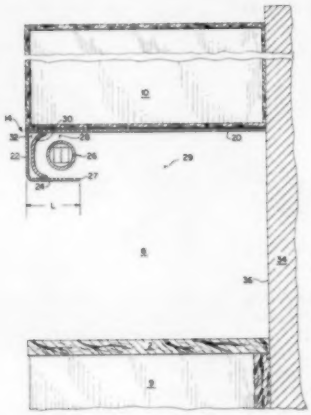
1. A task lighting fixture comprising

a substantially light opaque upper wall,

a front wall depending from said upper wall,

a re-entrant, lower wall projecting generally inwardly from said front wall in spaced underlying relationship with respect to said upper wall,

at least one light source receiving recess defined between said walls, and



said lower wall being of sufficient length that when said fixture is hung with said lower wall in a generally horizontal position, no significant portion of the light emitted by a light source disposed in said recess is projected directly downwardly to a work station underlying said fixture.

4,434,454

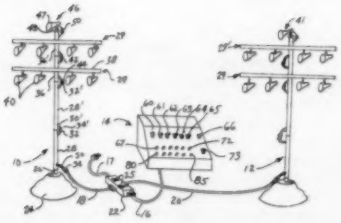
ACTIVE LIGHTING SYSTEM INCLUDING LIGHT CONTROL KEYBOARD

J. Michael Day, 18515 Allendale, Saratoga, Calif. 95070

Filed Feb. 6, 1981, Ser. No. 231,960

Int. Cl.³ F21V *19/00*

U.S. Cl. 362—238 **6 Claims**



1. An active stage lighting system of the type used to accompany musical performances and the like comprising

a plurality of multicolored spotlights;

support means for supporting said spotlights at selected elevations and for allowing said spotlights to be aimed in selected directions, said support means including a base, one or more tubular riser segments, and one or more spotlight carrying modules, all of which may be interconnected to form a single unit, said riser segments and said spotlight carrying modules being provided with lengths of multi wired electrical cable, the respective ends of which include electrical connectors such that when the several cables are connected together, electrical circuits are completed between said keyboard unit and said spotlights, all

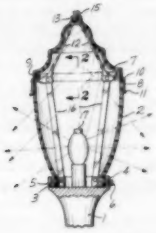
of the length of each said electrical cable being contained within a corresponding riser segment and the connectors attached to each end thereof being disposed within and affixed to the end portions of the riser segment such that when one riser segment is mated with another, the corresponding connectors are also mated together.

4,434,455

DIFFERENTIAL LIGHT EMISSION TRANSLUCENT LIGHT BOWL AND CAP

William H. Merritt, 3812 - 32nd Ave. West, Seattle, Wash. 98199

Filed May 1, 1981, Ser. No. 259,404
Int. Cl.³ F21V *7/00*
U.S. Cl. 362—307 **1 Claim**



1. A lighting device adapted to be mounted on a lamppost, comprising a light source, and an enclosure composed of a lower bowl portion in the shape of an upwardly flaring body of circular cross section enclosing said light source and having an open upper end located a substantial distance above said light source and a generally conical cap separate from said lower bowl portion and having its base closing the upper end of said lower bowl portion, said light source projecting light rays to the inner surface of said generally conical cap without obstruction, said bowl and said cap being made of the same kind of plastic material having the same color characteristics, the plastic material of said lower bowl portion containing pigment so that said lower bowl portion is highly translucent but not transparent and the material of said cap containing a much greater proportion of the same pigment as in the lower bowl portion material so that said cap is slightly translucent, much less translucent than the material of said lower bowl portion, thereby effecting transmission of a much greater portion of the light emanating from said light source through said lower bowl portion than through said cap and effecting reflection downward from the interior of said generally conical cap of light projected upward from said light source to pass through the wall of said lower bowl portion, for producing a strong downward illumination and a faint upward illumination.

4,434,456

LUMINAIRE BIRDSHIELD

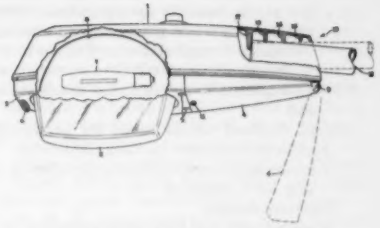
Carl D. Taylor, Hendersonville, N.C., assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 3, 1982, Ser. No. 446,809
Int. Cl.³ F21V *17/00*
U.S. Cl. 362—374 **6 Claims**

1. A luminaire comprising a housing having slipfitter accommodating a range of pipe sizes as support entering through the back and a birdshield closing off the back end,

said birdshield comprising a substantially flat piece of moderately stiff and resilient material cut to a pattern fitting into the rear of the luminaire housing and having a hole therethrough proportioned to receive a size of pipe accommodated in said slipfitter,

and means holding said birdshield captive in said luminaire comprising bent-out tabs on each side of said piece retained to the piece along their top edge and leaning forward relative to the plane of the piece, said tabs being disposed to fold in under hook means in said housing and



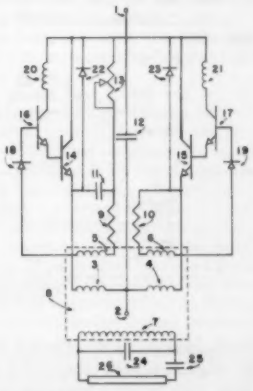
then snap out and engage the hook means when the birdshield is inserted up into the luminaire.

4,434,457

NONSATURATING ELECTRONIC BALLAST FOR GAS DISCHARGE TUBES

Guido Arena-Ochoa, Colina de la Ilusion #49, Fraccionamiento Bulevares, Edo.d, Mexico

Filed Oct. 27, 1981, Ser. No. 315,421
Claims priority, application Mexico, Oct. 27, 1980, 184492
The portion of the term of this patent subsequent to Jun. 30, 1998, has been disclaimed.
Int. Cl.³ H02M *7/537*
U.S. Cl. 363—133 **6 Claims**



1. A pulse generator circuit comprising

first and second terminals connectable to a unidirectional power source;

a transformer having a nonsaturating core and five magnetically coupled windings on said core including first and second primary windings and first, second and third secondary windings,

one end of each of said primary windings being connected to said first terminal,

said first and second secondary windings having substantially the same number of turns;

said third secondary winding being connectable to a load device;

first feedback circuit means for providing negative feedback comprising

a first signal transistor having its collector connected to said second terminal;

a resistor;

a capacitor;

a first forward biased slow-recovery diode connected to the base of said first signal transistor and to one end of said first secondary winding; and

a first power transistor having its base connected to the emitter of said first signal transistor, having its emitter connected through said capacitor and said first resistor to the other end of said first secondary winding, and having its collector connected to said second terminal; and

second feedback circuit means for alternately providing positive and negative feedback comprising

a second signal transistor having its collector connected to said second terminal;

a second resistor;

a second slow recovery diode connected to the base of said second signal transistor and to one end of said second secondary winding; and

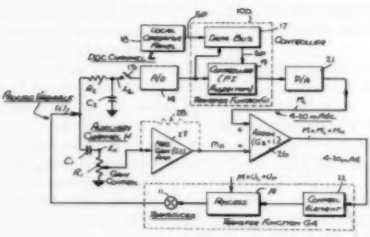
a second power transistor having its base connected to the emitter of said second signal transistor, having its emitter connected through said second resistor to the opposite end of said second secondary winding, and having its collector connected to said second terminal.

4,434,458

AUXILIARY CHANNEL FOR DIRECT DIGITAL CONTROL SYSTEM

Masahiro Kazahaya, Southampton, Pa., assignor to Fischer & Porter Company, Warminster, Pa.

Filed Sep. 16, 1981, Ser. No. 305,036
Int. Cl.³ G05B *21/02*; G06F *15/46*
U.S. Cl. 364—138 **8 Claims**



1. In combination with a direct digital control system provided with a digital computer common to a plurality of process control loops, each having a transducer sensing a respective process variable to produce an input analog signal dependent thereon, and a final control element to correct the process and responsive to an output analog signal derived from the output of the computer in which each process variable is compared with a set point, the input analog signals from the transducers being sequentially applied to the input of the computer at a relatively slow sampling rate through an analog-to-digital converter; an auxiliary channel associated with a selected loop included in the system to expand its frequency response beyond the response dictated by the slow sampling rate, said auxiliary channel comprising means responsive only to the high-frequency component of the analog input signal from the selected loop to produce an output analog signal proportional thereto which is combined in an adder with the output analog signal derived from the computer to produce a composite signal which is applied to the final control element to effect correction of the process throughout the full range of slow and rapid process changes.

4,434,459

DATA PROCESSING SYSTEM HAVING INSTRUCTION RESPONSIVE APPARATUS FOR BOTH A BASIC AND AN EXTENDED INSTRUCTION SET

Charles J. Holland, Northboro; Steven Wallach, Framingham, and Carl J. Alsing, Hopkington, all of Mass., assignors to Data General Corporation, Westboro, Mass.

Filed Apr. 25, 1980, Ser. No. 143,982
Int. Cl.³ G06F *9/00*
U.S. Cl. 364—200 **8 Claims**

1. A data processing system having a processor unit which includes means for supplying instructions and a main memory containing a plurality of segment storage regions, said system including

a plurality of segment identification registers each associated with one of said segment storage regions and capable of storing a 32-bit double word which points to a memory management table related to said region, said segment identification registers being located externally of said main memory;

accumulator storage means for storing a starting address of a block of double words stored in main memory;

instruction decode means connected to said instruction supplying means and responsive to an instruction therefrom requiring the storage of said block of data words into said segment identification registers for providing selected control signals;

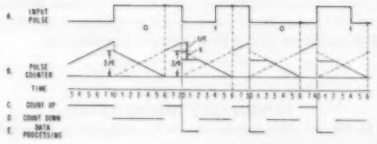
means connected to said instruction decode means, to said accumulator storage means, to said main memory and to said segment identification registers and responsive to said selected control signals for accessing the first word of said block of double words at said starting address in said main memory and for loading the double words in said block into said plurality of memory management registers, said double words being loaded sequentially into said registers in a preselected order.

4,434,460

HIERARCHICAL COMPUTER SYSTEM FOR GENERATING SELECTIVE OUTPUT SIGNALS IN RESPONSE TO RECEIVED INPUT SIGNALS

Karl-Gunnar Drakenborn, Alvsjo; Mats A. Enser, Lidingo; Kurt G. E. Grebner, Stocksund, and Erik I. Wallmark, Lidingo, all of Sweden, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 18, 1980, Ser. No. 160,760
Claims priority, application Sweden, Jun. 18, 1979, 79053500
Int. Cl.³ G06F *3/04*
U.S. Cl. 364—200 **7 Claims**



1. A computer system wherein a microcomputer comprising an arithmetic unit and a plurality of registers is connected to a signal source and a computer, said microcomputer is programmed for decoding an input signal from said signal source composing the decoded signal into an message, and transmitting the message to said computer, the improvement comprising:

said microcomputer comprising means for detecting the change in level of the input signal;

said microcomputer comprising means for decrementing which is operatively connected to a first of said registers and responsive to said detecting means, wherein said decrementing means decrements the contents of said first

register from a first predetermined value commencing n+1 clock cycles after the input signal changes level, whereby n clock cycles are available to the microcomputer to compose said message;

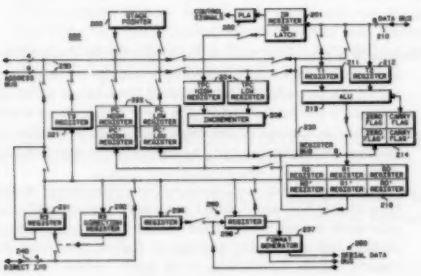
said microcomputer unit further comprising a means for loading said first register with a second predetermined value from a second of said registers when said first register means reaches zero, a means responsive to the detection means for incrementing said first register, said second predetermined value is incremented until the input signal again changes level, and means responsive to the detection means to generate a new first predetermined value and a new second predetermined value from the final incremented value in said first register.

4,434,461

MICROPROCESSOR WITH DUPLICATE REGISTERS FOR PROCESSING INTERRUPTS

Larry C. Puhl, Sleepy Hollow, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 15, 1980, Ser. No. 187,302
Int. Cl.³ G06F *9/46, 7/14*
U.S. Cl. 364—200 **9 Claims**



1. An improved microcomputer coupled to at least one interrupt signal from a signal source and a clock signal from a signal source, said microcomputer having at least one input signal and at least one output signal and including clock and interrupt control logic coupled to the clock and interrupt signals, respectively, said microcomputer comprising:

data bus means having a plurality of data bus lines for carrying binary signals;

instruction register means having a plurality of signals and being connected directly to the data bus lines for receiving signals therefrom;

programmable logic means coupled to the instruction register means for providing a plurality of control signals in response to the instruction register means signals;

register bus means having a plurality of register bus lines for carrying binary singals;

means for intercoupling the register bus lines and data bus lines in response to predetermined ones of the programmable logic means control signals;

address bus means having a plurality of address bus lines for carrying binary signals;

program counter register means having a plurality of signals and further including duplicate program counter register means coupled in parallel therewith and having a plurality of signals, said program counter register means being switchably connected to the address bus lines in response to predetermined ones of the programmable logic means control signals for applying signals thereto, and said duplicate program counter register means being switchably connected to the address bus lines in place of the program counter register means in response to the interrupt signal;

incrementing means;

temporary program counter register means having a plurality of signals, said temporary program counter register means switchably connected to the address bus lines or register bus lines in response to predetermined ones of the programmable logic means control signals for receiving signals from the address bus lines and register bus lines, said incrementing means coupled to the temporary program counter register means for incrementing the temporary program counter register means signals in response to predetermined ones of the programmable logic means control signals and applying the incremented temporary program counter register means signals to the program counter register means and the duplicate program counter register means, said incremented temporary program counter register means signals further being switchably connected to the register bus lines in response to predetermined ones of the programmable logic means control signals;

a plurality of general purpose register means each having a plurality of signals and duplicate general purpose register means coupled in parallel therewith and having a plurality of signals, each general purpose register means switchably connected to the register bus lines in response to predetermined ones of the programmable logic means control signals for applying signals to the register bus lines and directly connected to the register bus lines for receiving signals from the register bus lines in response to predetermined ones of the programmable logic means control signals, and each duplicate general purpose register means switchably connected to the register bus lines in place of its corresponding general purpose register means in response to the interrupt signal; and

first and second flip-flop means each storing corresponding condition signals and having duplicate flip-flop means coupled in parallel therewith, the condition signals being coupled to arithmetic logic means, and said duplicate flip-flop means being switchably coupled in place of the corresponding first and second flip-flop means in response to the interrupt signal;

arithmetic logic means having first and second register means each having a plurality of signals, the first register means being directly connected to the data bus lines for receiving signals therefrom and the second register means being directly connected to the register bus lines for receiving signals therefrom, said arithmetic logic means combining the first and second register means signals according to predetermined combinatorial functions selected by corresponding predetermined ones of the programmable logic means control signals and storing predetermined binary states of the condition signals in the first and second flip-flop means depending on the condition of said combined first and second register means signals, and said combined first and second register means signals further being switchably applied to the register bus lines in response to a predetermined one of the programmable logic means control signals.

4,434,462

OFF-CHIP ACCESS FOR PSUEDO-MICROPROGRAMMING IN MICROPROCESSOR

Karl M. Guttag, and Jerry R. Vanaken, both of Houston, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 24, 1980, Ser. No. 210,107
Int. Cl.³ G06F *9/30, 13/06*
U.S. Cl. 364—200 **11 Claims**

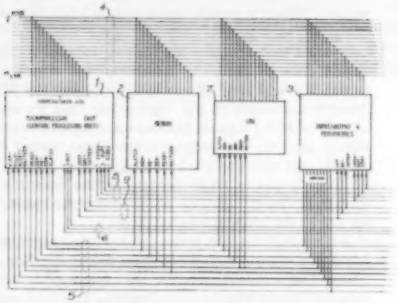
1. A microprocessor comprising:

a main memory containing a plurality of locations defined by an address space, the main memory having an address input, a data output and a control input,

a central processing unit in a semiconductor unit separate from said main memory, said central processing unit including an arithmetic logic unit, a plurality of registers, a program counter, an instruction register for receiving

program instructions addressed by said program counter for execution by the central processing unit, such program instructions being of a predetermined instruction set as stored in said main memory, and control means responsive to the program instructions of said instruction set in said instruction register to produce a plurality of controls for defining the operation of the central processing unit and for generating memory controls,

bus means connecting terminals of the central processing unit to the address input and data output of said main memory to transfer addresses from the program counter of the central processing unit to said main memory and to transfer instructions from said main memory to the central processing unit, the number of bits of said program counter and said bus means for such addresses defining the size of said address space, said bus means also transferring said memory controls from said control means to said control input of said main memory,



a first storage means containing sequences of program instructions in a plurality of memory locations defined by a first set of addresses, and means coupling addresses from said program counter to the first storage means to fetch instructions while disabling said main memory by said memory controls whereby the first set may overlap said address space,

a separate second storage means containing sequences of program instructions in a plurality of memory locations defined by a second set of addresses, and means coupling addresses from said program counter to the second storage means to fetch instructions while disabling said main memory by said memory controls whereby the second set may overlap said address space,

and means initiated by the control means in response to predetermined program instructions, for transferring sequences of program instructions from such first or second storage means to said instruction register, such sequences being instructions of said instruction set.

4,434,463

MULTIPROCESSOR TOPOLOGY WITH PLURAL BASES FOR DIRECTLY AND INDIRECTLY COUPLING ADDRESSES AND RELAY STATIONS

Jean-Paul Quinquis, rue de Cornic, Perros Guirec, France 22700, and Michel A. Devault, 22, rue de Bourgogne, Lannion, France (22300)

Filed Nov. 26, 1980, Ser. No. 210,819

Claims priority, application France, Nov. 30, 1979, PV 7929571

Int. Cl.³ G06F *15/16*

U.S. Cl. 364—200 **6 Claims**

1. A multiprocessor system comprising:

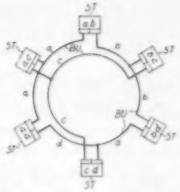
a plurality of P buses having addresses from 1 to P, P being an integer at least equal to 4;

a plurality of P (P−1)/2 stations, each including a processor and connected to a pair of connecting buses, the bus pair being different for each processor station and each bus being connected to (P−1) processor stations, means for connecting each processor station directly by its connecting bus pair to 2 (P−2) other processor stations and for connecting each processor station indirectly to (P−2) (P−3)/2 other processor stations through one single processor station acting as a relay station;

the buses being respectively assigned single address words;

each processor station being assigned an address formed by the grouping in any order the single address words of the two buses forming the pair of connecting buses for the particular processor station;

means in a calling processor station for transmitting to an addressee processor station data and the two address words assigned to said address processor station;



means in a processor station for respectively deriving first and second responses in response to receipt by the processor of the two address words being the address of (a) said processor station formed by the same two address words, and (b) the address of said processor station and the two address words having only a single address word in common,

said processor station including means respectively responsive to the first and second responses for activating the processor station to function as the addressee processor station and as a relay processor station, the processor station, when functioning as a relay station, including means for connecting together the two buses of the pair of connecting buses thereof.

4,434,464

MEMORY PROTECTION SYSTEM FOR EFFECTING ALTERATION OF PROTECTION INFORMATION WITHOUT INTERVENTION OF CONTROL PROGRAM

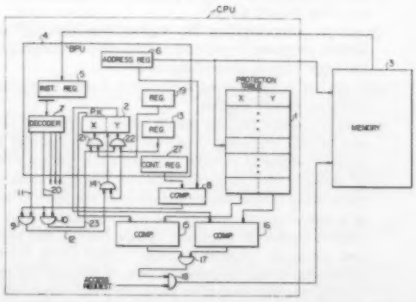
Hitoshi Suzuki, Owariasahi; Shigekatsu Takahashi, Ayase, and Yoshiki Fujioka, Owariasahi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 31, 1981, Ser. No. 249,500

Claims priority, application Japan, Apr. 1, 1980, 55-42126

Int. Cl.³ G06F *9/46*

U.S. Cl. 364—200 **12 Claims**



1. A memory protection system for use in a data processing

system including a main memory having a plurality of memory areas accessed by respective memory addresses and a program implemented processor for accessing said main memory by application of selected addresses thereto, comprising:

first storage means for storing therein first predetermined protection information for each of the respective memory areas of said main memory;

second storage means for storing therein second predetermined protection information for a selected program to be performed by said processor;

first detecting means for detecting that an instruction to be executed by said processor is a predetermined instruction;

second detecting means for detecting that an address for access to said main memory specified by said predetermined instruction is a predetermined address;

determining means connected to said first and second storage means for collating the first protection information stored in said first storage means corresponding to one of the memory areas accessible by an address stored at said predetermined address in said main memory with the second protection information stored in said second storage means, thereby to determine whether the memory access is to be allowed or inhibited; and

altering means responsive to outputs of said first and second detecting means for altering the second protection information stored in said second storage means, when said first detecting means detects that an instruction to be executed is a predetermined instruction and said second detecting means detects that the address specified by the predetermined instruction is a predetermined address.

4,434,465

SHARED MICROINSTRUCTION STATES IN CONTROL ROM ADDRESSING FOR A MICROCODED SINGLE CHIP MICROCOMPUTER

Kevin C. McDonough; John W. Hayn, and Jeffrey D. Bellay, all of Houston, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 13, 1981, Ser. No. 253,981

Int. Cl.³ G06F *9/22*

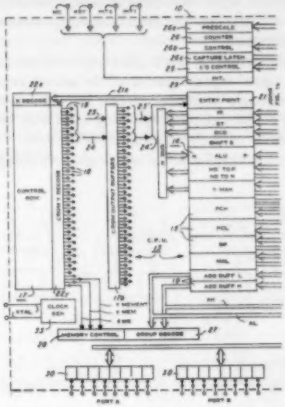
U.S. Cl. 364—200 **9 Claims**

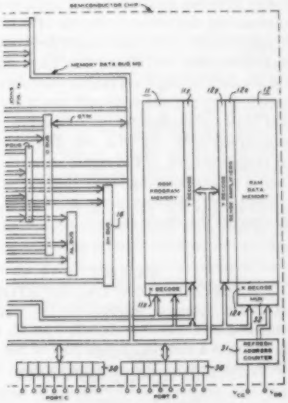
1. A microprocessor device comprising:

a semiconductor integrated circuit having an arithmetic/logic unit, a plurality of registers for storing data and memory addresses, busses for interconnecting the arithmetic/logic unit and the registers, means for providing instruction words to an instruction register, and control means having a control means output which is connected to said arithmetic/logic unit, said busses, and said registers, said control means for generating commands for controlling operation of the arithmetic/logic unit and accessing the busses and registers in response to said instruction words applied to an input of the control means from the instruction register; and clocking means coupled to said arithmetic/logic unit, said registers, said busses and said control means for defining repetitive mirocode state times, all within the integrated circuit,

and wherein the control means includes a read-only-array having an address input and a multi-bit microcode command output connected to said control means output, the control means including means for producing a multi-bit microcode command at said control means output during each microcode state time, and the control means includes addressing means receiving said instruction word from said input and applying sequences of addresses to said address input, one address in each microcode state time, said sequences beng selected by said instruction word whereby each sequence defines an operation which is determined by such instruction word, and each sequence including a plurality of microcode states,

said addressing means providing said sequences of addresses in response to said instruction word in the instruction register whereby said addressing means for each said sequences selects the addresses of a first subset of microcode states, which defines the instruction operand mode, from a first set of microcode states which defines a plurality of operand addressing modes, and then selects the addresses of a second subset of microcode states, which defines the arithmetic/logic function of the instruction,





from a second set of microcode states defining a plurality of arithmetic/logic functions, a plurality of the addresses of the subsets of the first set sharing a single address which defines a single microcode state, the operand addressing modes providing alternative methods of selecting operands for application to inputs of the arithmetic/logic unit.

4,434,466

APPARATUS FOR CONTROLLING THE ACCESS OF PROCESSORS AT A DATA LINE

Paul Friedli, Zurich, and Hans G. Süss, Udligenswil, both of Switzerland, assignors to Inventio AG, Hergiswil, Switzerland

Filed Oct. 13, 1981, Ser. No. 310,589

Claims priority, application Switzerland, Oct. 20, 1980, 7797/80

Int. Cl.³ G06F *15/00*

U.S. Cl. 364—200 **4 Claims**

1. An apparatus for controlling the access of microprocessors at a data line, comprising:

a plurality of microprocessors;

a data line;

an input-output interface component provided for each microprocessor for connecting each related microprocessor with the data line;

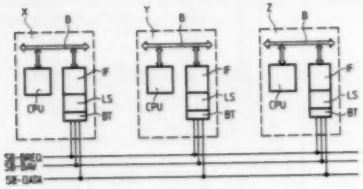
each input-output interface component reading an access request of its related microprocessor;

a respective logic switching circuit operatively connected with the input-output interface component of the related microprocessor;

said logic switching circuit having a request output delivering a signal representative of the access request;

each said logic switching circuit having a priority counter and a priority output signalling a priority with respect to the access of the related microprocessor;

a single first line for all of said logic switching circuits;



a single second line for all of said logic switching circuits;

a respective first bus driver for each logic switching circuit for connecting the request outputs of each of said logic switching circuits with each single first line;

a respective second bus driver for each logic switching circuit for connecting the priority outputs of each of said logic switching circuits with said single second line; and

each said logic switching circuit containing a first reading input coupled with the first bus driver for receiving a signal representative of the signal state of the single first line and a second reading input coupled with the second bus driver for receiving a signal representative of the signal state of the single second line.

4,434,467

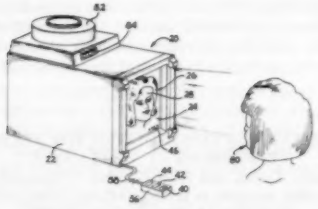
HAIR COLORING CALCULATOR

Dale Scott, 71925 Kempton, Rancho Mirage, Calif. 92270

Continuation-in-part of Ser. No. 29,575, Apr. 12, 1979, Pat. No. 4,258,478, which is a continuation-in-part of Ser. No. 904,237, May 9, 1978, abandoned. This application Mar. 30, 1981, Ser. No. 248,825

Int. Cl.³ G06F *15/20*

U.S. Cl. 364—400 **19 Claims**



1. An apparatus for designating hair coloring products which will change an existing hair color to a new hair color, comprising:

keyboard means for entering designations representative of an existing and a new hair color;

electronic means responsive to said keyboard means for converting said designations of the existing hair color into a first coded signal and for converting said designations of the new hair color into a second coded signal;

storage means for storing a plurality of formulations of hair coloring products which will change any of a plurality of existing hair colors to any of a plurality of new hair colors;

output means responsive to said first and second coded signals for obtaining the formulation from said storage means corresponding to said first and second coded signals, whereby the hair coloring products which will change the existing hair color to the new hair color will be provided.

4,434,468

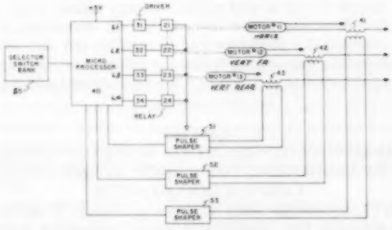
AUTOMATIC POSITION CONTROL FOR A VEHICLE SEAT

Gary R. Caddick, Lake Orion, and Philip Q. Guest, Jr., Birmingham, both of Mich., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Division of Ser. No. 84,108, Oct. 12, 1979. This application Jul. 23, 1981, Ser. No. 286,236

Int. Cl.³ A47C *1/02;* **G06F** *15/20*

U.S. Cl. 364—424 **5 Claims**



1. Apparatus for controlling the position of a vehicle seat within a powered seat mechanism, said apparatus including a reversible motor rotatable to drive said seat in either of two opposite directions within a travel path of limited extent, means for producing digital signals during rotation of the motor representative of the position of the seat within said travel path, logic and signal storage means including memory means receptive of said digital signals for storing therein data representative of the actual position of the seat within said travel path, manually selective position conrol means for setting said memory means to store data representative of a desired position within said travel path for said seat, position recall means manually actuatable to signal said logic and storage means to initiate rotation of the motor to drive said seat toward the desired position, said signal producing means operative during rotation of said motor to produce signals for transmission to said memory means to control the drive of the seat to the desired position, and in which said memory means has the capacity for storing at least 2n digital signals where n is equal to the number of digital signals produced during the drive of the seat through the extent of the travel path in one direction.

4,434,469

AUTOMATIC SPEED CONTROL SYSTEM FOR AN AUTOMOTIVE VEHICLE

Kouichi Suzuki, and Kazuyuki Mori, both of Yokohama, Japan, assignors to Nissan Motor Company, Limited, Kanagawa, Japan

Filed Jan. 15, 1981, Ser. No. 225,370

Claims priority, application Japan, Jan. 18, 1980, 55-3655

Int. Cl.³ B60K *31/00*

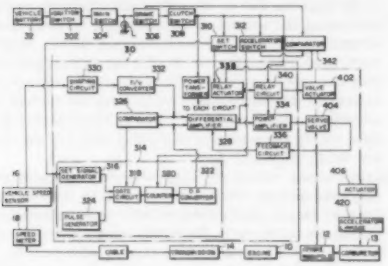
U.S. Cl. 364—426 **16 Claims**

1. An automatic speed control system for an automotive vehicle comprising:

a vehicle speed sensor for determining a vehicle speed and generating a sensor signal having a value indicative of the determined vehicle speed;

first means including presetting means for presetting a desired vehicle cruise speed to drive the vehicle at the preset cruise speed, said presetting means being manually operative for presetting said cruise speed as it is operated;

second means having an operative and an inoperative condition, said second means manually operable, independently of said first means, for resetting the preset cruise speed in said first means and for changing the preset value in said presetting means, said second means accelerating the vehicle at a predetermined rate while it is in its operative condition, said second means activating said first means in response to said second means attaining said inoperative



condition thereby to change the preset value in said first means to a current vehicle speed determined when said second means attains said inoperative condition;

a power circuit for supplying electric power to said first and second means while the system is operating;

third means, responsive to a decelerating operation of the vehicle for generating an interruption signal for interrupting the operation of said control system; and

fourth means, connected between said power circuit and said first means and associated with said second and third means, for cutting off the electric connection between said power circuit and said first means in order to make said control system inoperative in response to said interruption signal when said second means is in its operative condition.

4,434,470

SPEED MEASUREMENT SYSTEM WITH MEANS FOR CALCULATING THE EXACT TIME PERIOD OF A KNOWN QUANTITY OF SPEED PULSES

Robert C. Thomas; John A. Hornbuckle, and Richard J. Fatka, all of South Bend, Ind., assignors to The Bendix Corporation, Southfield, Mich.

Filed Feb. 9, 1981, Ser. No. 232,615

Int. Cl.³ G01P *3/481*; G01B *7/14*; G06F *15/20*

U.S. Cl. 364—565 **8 Claims**

4. A speed measurement system for measuring rotational speed of a rotating member including a high speed clock and means producing a sampling pulse, said system comprising:

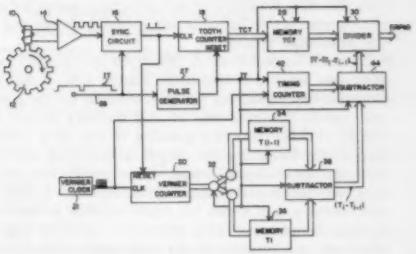
means rotatable in proportion to the rotational speed of said rotating member producing signal proportional to the speed of said rotating member,

a synchronizing circuit connected to receive said signal and to convert said signal to a series of sharp reset pulses of the same frequency as said signal,

first and second counters connected to said synchronizing circuit and said high speed clock, respectively, such that the initiation of said sampling pulse enables said synchronizing circuit to output reset pulses to said first and second counters, receipt of each of said reset pulses by said second counter causing said counter to be reset to zero and begin counting high speed counts anew, and said first counter counts said reset pulses,

first and second memory means connected to said second counter with said first memory means connected to accumulate and hold clock counts occurring between the initiation of said sampling pulse and the previous reset pulse and said second memory means connected to accumulate and hold clock counts occurring between the termination of said sampling pulse and the previous reset pulse,

first subtractor circuit means connected to said first and second memory means producing an output representing the difference in counts contained in said first and second memory means,



a divider circuit connected to said first counter and means responsive to the termination of said sampling pulse to transfer the counts of said first counter to said divider circuit,

third counter means providing a count of the number of clock pulse counts during said sampling pulse,

second subtractor circuit means subtracting the output of said first subtractor circuit from the output of said third counter means, and

means connecting the output of said second subtractor circuit means to said divider circuit such that upon termination of said sampling pulse the output of said first counter is divided by the output of said second subtractor circuit means to produce a digital signal representing rotational speed of said rotating member.

4,434,471

TEXT PROCESSING DEVICE

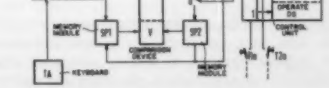
Eugen Hildinger, deceased, late of Soecking, Fed. Rep. of Germany (by Marianne Hildinger, heir), assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jul. 25, 1979, Ser. No. 60,418

Claims priority, application Fed. Rep. of Germany, Aug. 31, 1978, 2838063

Int. Cl.³ G06F *13/04*

U.S. Cl. 364—900 **2 Claims**



1. In a text processing device for utilization with a text-proc-

essing typewriter having a data memory device into which information may be entered by means of the keyboard of the typewriter, and stored for subsequent operational control thereby of a data output device, such as the printer device of the typewriter;

the combination of a comparison device having switching means for selectively controlling and completing the connections between the typewriter keyboard, printer device, and memory device including a data memory having a memory area for containing identification data,

a keyboard means for supplying indentification data, from such area, to the input of the comparison device, means including said switching means for supplying identification data, manually input from the keyboard, to another input of the comparison device, said comparison device in the presence of coincidence of the compared identification data, effecting actuation of said switching means for completing connection between the memory device and the text processing typewriter

a control unit for said memory device for locating and evaluating data located in said identification area of said data memory, said switching means controlled by the control unit and by the read unit of said memory device as a function of the scanning position in the data memory thereof, for switching the output of said read unit over from the data output device to the comparison device upon the existence of a matching identification area in said data memory, and means for supplying data to said comparison device comprising respective memory registers which are preconnected to the comparison device, one of said memory registers receiving identification data from said data memory and the other of said memory registers receiving identification data manually input from said keyboard,

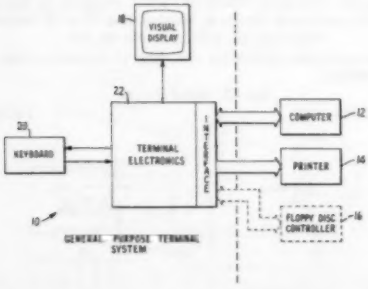
and further comprising a hand actuable switching unit for further operation of the control unit for locating an identification area and for switching on or off the data output device.

4,434,472

GENERAL PURPOSE DATA TERMINAL SYSTEM WITH DISPLAY LINE REFRESHING AND KEYBOARD SCANNING USING PULSEWIDTH MODULATION

Lee Kachun, Fremont, Calif., assignor to Falco Data Products, Sunnyvale, Calif.

Filed Dec. 29, 1980, Ser. No. 220,279
Int. Cl.³ G06F *3/02, 3/153*
U.S. Cl. 364—900 **12 Claims**



1. Apparatus for line-by-line refreshing of a visual display, of the type used in a visual display system and included in a general purpose terminal to display visual information, the visual display system including, character and video generator means to convert display data into visual display information, a data bus, an address bus, visual display means responsive to the visual display information for displaying the visual display information, and clock and synchronizing means for controlling the conversion and display of the display data in the character and video generator means and in the visual display means, wherein the visual information is displayed display-line-by-display-line to form the visual display, and wherein each line has a corresponding sequence of display data, the line-by-line refreshing apparatus comprising:

addressable memory means responsive to a first and second set of addresses for storing the sequences of display data corresponding to each of the display lines of the visual display during a write cycle and at addresses specified in the first set of addresses, and for supplying display data to the character and video generator means during a refresh cycle, which data are supplied from address locations that are specified in the second set of addresses;

first temporary storage and incrementing means connected to the data bus and to the addressable memory means for generating the second set of addresses, wherein the first temporary storage and incrementing means receive a starting address on the data bus for the sequence of display data corresponding to the display line to be refreshed and increment the starting address to form the second set of addresses, which second set includes the addresses for the data within the sequence of display data for the display line being refreshed; and

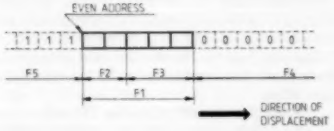
microprocessor means for supplying the sequences of display data and the first set of addresses to the addressable memory means via the data and address buses respectively during the write cycle, for maintaining a starting address table in which is arranged the starting addresses for each sequence of display data for each line of the visual display in the order in which each line is to be refreshed in the visual display means, and for supplying each starting address by way of the data bus to the first temporary storage and incrementing means during the refresh cycle, in accordance with the table, to refresh the visual display on a line-by-line basis and in real time.

4,434,473

METHOD AND DEVICE FOR STORING LOGIC REPRESENTATIONS OF PROCESS STATES

Ugon Michel, Plaisir, and Robert Herve, Versailles, both of France, assignors to Cii/Honeywell Bull (Societe Anonyme), Paris, France

Filed Mar. 12, 1981, Ser. No. 242,922
Claims priority, application France, Apr. 9, 1980, 80 07913
Int. Cl.³ G06F *11/00*
U.S. Cl. 364—900 **14 Claims**



1. A device for storing data representative of a state of a process capable of assuming different possible states, each process state being represented by a sequence of binary bits in a predetermined pattern, comprising a memory having a plurality of storage locations, each storage location having an address and the memory being initially unwritten such that the contents of storage locations following an initial address are all in a first logic state; means for addressing the memory; and means for writing data into the memory at locations selected by the addressing means, the writing means including means for writing data representative of an initial process state at consecutive storage locations beginning at the initial address and for thereafter writing subsequent data into the memory beginning at a successive address following the initial address such that a portion of previously written data comprises the

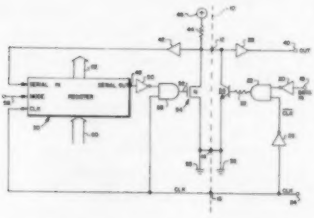
subsequent data and for writing into previously unwritten storage locations between the initial address and the successive address such that the contents of storage locations between the initial address and successive address are all in a second logic state opposite to the first logic state, the contents of all locations following the subsequent data being in the first logic state.

4,434,474

SINGLE PIN TIME-SHARING FOR SERIALLY INPUTTING AND OUTPUTTING DATA FROM STATE MACHINE REGISTER APPARATUS

David W. Best, Marion, and Jeffrey D. Russell, Cedar Rapids, both of Iowa, assignors to Rockwell International Corporation, El Segundo, Calif.

Filed May 15, 1981, Ser. No. 264,177
Int. Cl.³ G11C *11/40*; H04L *7/02*
U.S. Cl. 364—900 **7 Claims**



1. Apparatus for inputting data to and outputting data from a register through single terminal means relative a reference potential comprising, in combination:

single terminal means;

first means for supplying a clock signal having first and second logic states;

second means, connected to said first means and to said single terminal means for supplying input data bits to the single terminal means only when the clock signal is in the first logic state;

unitary register means having a plurality of a data bit storage stage, including serial data input means connected to said single terminal means, and independent serial data output means and clock means;

third means, connected between said serial data output means and said single terminal means and also connected to said first means, for supplying serial output data bits to said single terminal means when said clock signal is in the second logic state, the bits of the input and output data being supplied to said single terminal means in an interleaved fashion.

4,434,475

METHOD OF ENTERING CRITERIA FOR SELECTING RECORDS OF SPATIALLY RELATED DATA STORED IN AN INTERACTIVE TEXT PROCESSING SYSTEM

Rex A. McCaskill; John W. McInroy, and Paul D. Waldo, all of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 18, 1981, Ser. No. 264,303
Int. Cl.³ G06F *3/153*
U.S. Cl. 364—900 **6 Claims**

1. In an interactive text processing system having a display device, a keyboard and a microprocessor including a memory for storing (1) programs; (2) conventional text data in one format; and (3) files of spatially related text type data in second format, where each said file of said spatially related text type data comprises a plurality of vector formatted multi-field records including one header record for defining each of said fields, and a plurality of data records and where said display device includes a display screen having a cursor positionable by cursor move keys on said keyboard and a display format buffer for storing displayed data in said first format while said data is displayed on said screen and where a predetermined portion of a vector formatted record stored in said memory in said second format is converted from said second format to said first format prior to transfer to said display device for display as a line of text data on said screen and reconverted from said first format to said second format after transfer from said display device back to said memory for storage, an improved method for interactively entering field related selection criteria into said system to permit said system to identify each said data record in said predetermined file which meets said entered selection criteria, said method comprising the steps of:

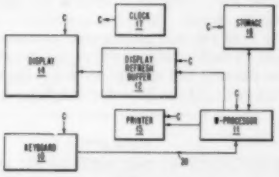
(a) entering into said system through said keyboard an indication of said predetermined file from which said system is to identify said data records in accordance with said selection criteria to be entered by said operator;

(b) converting a first portion of said header record for said predetermined file identified in step (a) from said second format to said first format;

(c) transferring said first portion to said display buffer after being converted to said first format in step (b);

(d) displaying on said display device said first portion of said header record that was converted in step (b) and a predetermined number of qualifying rows with said cursor positioned at a predetermined position in the first row of said qualifying rows;

(e) moving said cursor horizontally by operation of one of said cursor move keys from said predetermined position established in step (d) to a first field position corresponding to the first said selection criterium to be entered;



(f) entering said first selection criterium through said keyboard into said system to update said display buffer to also display said first selection criterium in said first row;

(g) moving said cursor vertically to the next said qualifying row by operation of another said cursor move key and horizontally in said next said qualifying row by said one key to a next said field position corresponding to the next said selection criterium to be entered;

(h) entering said next said selection criterium through said keyboard into said system to update said display buffer to also display said next said selection criterium entered in said next said qualifying row;

(i) repeating steps (g) and (h) until said selection criteria have been entered into each of said displayed predetermined number of qualifying rows;

(j) activating said another said cursor move key to move said cursor vertically to a line on said display device following the last said row of said predetermined number of rows to cause said system to automatically update said display buffer to display one additional qualifying row for entry of further selection criterium by said operator; and

(k) transferring said entered selection criteria from said display buffer to said memory after entry of all said selection criteria including the step of converting said entered criteria to said second format prior to storage in said memory;

to permit said system to identify each said record in said predetermined file by comparing each said entered criterium with the data stored in the corresponding field of each said record.

4,434,476

MAGNETIC BUBBLE MEMORY DEVICE AND METHOD FOR OPERATING THE SAME

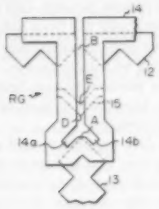
Kazuo Matsuda; Makoto Ohashi, both of Kawasaki; Yoshio Satoh, Yokohama; Tsutomu Miyashita, and Kazunari Komenou, both of Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Aug. 17, 1982, Ser. No. 408,849

Claims priority, application Japan, Aug. 17, 1981, 56-127710; Aug. 17, 1981, 56-127711

Int. Cl.³ G11C *19/08*

U.S. Cl. 365—12 8 Claims



1. A magnetic bubble memory device comprising

a magnetic layer including a first region with an easy axis of magnetization extending in a certain direction, and a second region surrounding said first region and having an easy axis of magnetization substantially perpendicular to that of the first region, said first region defining a plurality of bubble propagation patterns, and

a replicate gate including a stretch conductor pattern, to which an electric current is applied so as to stretch a bubble between said propagation patterns, and a cutting pattern formed in said second region between said propagation patterns and adapted to lower the bubble collapse field so as to cut the stretched magnetic domain.

4,434,477

MECHANICALLY ADDRESSED OPTICAL MEMORY

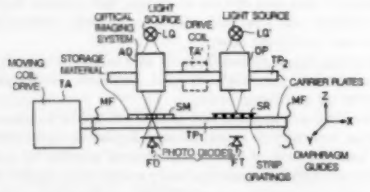
Ingolf Sander, and Bernhard Hill, both of Hamburg, Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 883,497, Mar. 6, 1978. This application Nov. 13, 1979, Ser. No. 93,335

Claims priority, application Fed. Rep. of Germany, Mar. 9, 1977, 2710166

Int. Cl.³ G11C *13/04*

U.S. Cl. 365—120 31 Claims



27. An apparatus for optical storage or retrieval of information comprising a memory for storing information in a form which can be read by a beam of radiation, means for producing from a beam of radiation a spot on said memory for reading said information stored therein or for writing information thereon, means for supporting said memory and said spot producing means for movement relative to each other so that given locations on said memory can be addressed by said spot, and means for determining the position of said memory relative to said spot producing means, said determining means including two optical gratings oriented perpendicular to each other, said gratings being coupled to said memory for movement therewith, and means for detecting variations in the brightness of light passing through said gratings upon movement thereof and generating therefrom pulses representative of the distance moved.

4,434,478

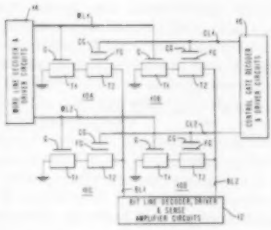
PROGRAMMING FLOATING GATE DEVICES

Herbert C. Cook, Georgia, and Ronald R. Troutman, Essex Junction, both of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 27, 1981, Ser. No. 325,479

Int. Cl.³ G11C *11/40*

U.S. Cl. 365—185 17 Claims



17. A memory cell comprising

a semiconductor substrate having spaced apart source and drain regions,

a control gate,

a floating gate insulated from said control gate and from said substrate so as to form a capacitive coupling factor therewith, said floating gate having a floating gate voltage-current characteristic wherein said current is maximum at a given floating gate voltage,

means for applying a voltage to said control gate providing substantially said given voltage to said floating gate, and

means for increasing said control gate voltage at a rate substantially equal to the decrease in voltage on said floating gate caused by current flow to said floating gate divided by said capacitive coupling factor.

4,434,479

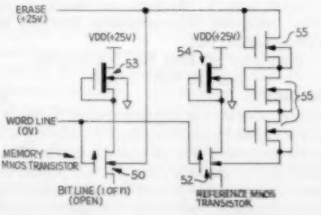
NONVOLATILE MEMORY SENSING SYSTEM

Yung J. Chen, Weston, Mass., and Eden Y. C. Mei, Huntington Beach, Calif., assignors to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Nov. 2, 1981, Ser. No. 317,007

Int. Cl.³ G11C *11/40*

U.S. Cl. 365—210 7 Claims



1. In a memory system comprising a nonvolatile memory transistor array, a self-tracking sensing apparatus comprising:

means to select a nonvolatile memory transistor to be sensed within the array;

a reference nonvolatile transistor wherein the reference transistor is substantially identical to the memory transistors in the memory array;

means to program the threshold voltage of the reference transistor to a lower level than that of an identically programmed memory transistors; and

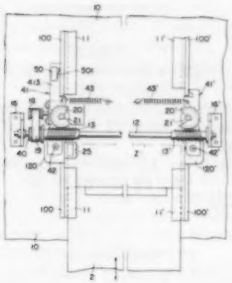
means to compare the programmed state of the memory transistor with the programmed state of the reference transistor.

4,434,480

AUTOMATIC LOADING APPARATUS

Akira Fukumitsu, Fukaya, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

Filed Sep. 23, 1981, Ser. No. 304,886
Claims priority, application Japan, Oct. 2, 1980, 55-138138
Int. Cl.³ G11B *17/04*
U.S. Cl. 369—77.2 **3 Claims**



1. In an apparatus for loading a disc recorded with information in a player of the type wherein a caddie containing said disc is inserted into the player along guide means, locking means is provided in said player for arresting the inserted disc, an empty caddie is withdrawn from said player leaving the arrested disc, and the information recorded on an arrested disc is then reproduced, the improvement comprising an electric motor, means connected to said motor for moving said caddie within said player, a first switch disposed to be actuated by said caddie when the same is mounted on said guide means, said first switch causing rotation of an electric motor in a direction which causes said moving means to insert said caddie into said player, a second switch mounted on said locking means to be actuated by said caddie when the same engages said locking means, said second switch causing rotation of said motor in a reverse direction which causes said moving means to withdraw said caddie from said player, and a third switch which is operated when said caddie is withdrawn from said player a predetermined distance for stopping said motor.

4,434,481

TRAVELING WAVE SURFACE ACOUSTIC WAVE TRANSDUCER

Minoru Toda, Princeton Junction, N.J., and Eiji Shima, Hachioji, Japan, assignors to RCA Corporation, New York, N.Y.

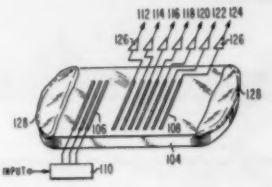
Filed Jul. 13, 1982, Ser. No. 397,936
Int. Cl.³ G11B *3/00*; H04R *17/04*
U.S. Cl. 369—132 **25 Claims**

1. A surface acoustic wave device comprising:

a support having a surface for supporting the propagation of surface acoustic waves;

a traveling wave surface acoustic wave transducer including a plurality of electrode fingers arranged in an array on said surface of said support, said array being provided such that each electrode finger is equally spaced from adjacent electrode fingers, said spacing effecting a periodicity, P; and

a driver delay line including a plurality of taps, each of said electrode fingers being connected to respective ones of



said plurality of taps, said driver delay line having an input end coupled to a source of signals and a termination end;

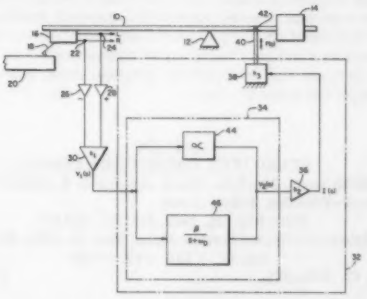
said signals from said source being coupled to said electrode fingers such that a surface acoustic wave propagates along said surface of said support in substantially one direction.

4,434,482

TONE ARM PICK UP SYSTEM

James M. Kates, Andover, Mass., assignor to Teledyne Industries, Inc., Los Angeles, Calif.

Filed May 29, 1979, Ser. No. 43,353
Int. Cl.³ G11B *3/10*
U.S. Cl. 369—230 **13 Claims**



1. In a warp-compensating system for use in a record player, which system comprises a pivotable tone arm carrying a stylus of predetermined compliance adapted to track the grooves of a record, and means responsive to the velocity of said stylus relative to said tone arm to provide a corresponding velocity signal,

the improvement comprising a compensation network for generating an output signal responsively to said velocity signal, and

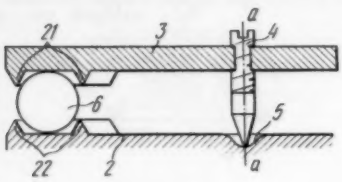
torque means coupled to said tone arm and responsive to said output signal for varying the tracking force applied to said record by said stylus,

said network and torque means being selected such that said output signal and the response of said torque means to said output signal modify at least the effective mass of said tone arm and stylus to provide to said tone arm and stylus a predetermined resonance quality factor and a resonant frequency between the upper limit of the normal record warp frequency range and at least the normal lower limit of the audio frequency range for such records.

4,434,483
TONE ARM

Vladimir F. Vinogradov, ulitsa Gorkogo, 135, kv.17, Riga, U.S.S.R.

Filed Nov. 27, 1981, Ser. No. 325,586
Int. Cl.³ G11B 17/02, 21/16, 3/10
U.S. Cl. 369—255 8 Claims

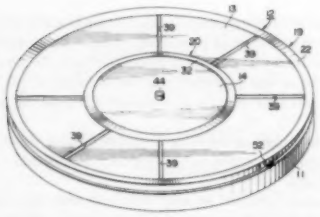


1. A tone arm comprising: a lever installed in a manner allowing rotation thereof about vertical and horizontal geometrical axes; a pickup cartridge secured on an end of said lever; means for setting the tracking force of said pickup cartridge; a movable base integral with said lever; a fixed base arranged opposite said movable base and designed to be attached to a panel of an electric record player; a spherical thrust bearing in one of said bases; a vertical pivot with a pointed portion interacting with said spherical thrust bearing in one base, its other end being secured on said other base; a guiding element in one of said bases; a ball arranged between said bases, said ball cooperating with said guiding element in one of the bases and making contact with the second base at a point of contact; said vertical geometrical axis of rotation of said lever being extended through a point of interaction between said pointed portion of said pivot and said spherical thrust bearing; said horizontal geometrical axis of rotation of said lever being formed by a straight line passing through said point of interaction between said pivot and the spherical thrust bearing, and through said point of contact.

4,434,484
STABILIZER FOR RECORD DISCS

Yoshiko Iwata, Machida, Japan, assignor to Kabushiki Kaisha Audio-Technica, Tokyo, Japan

Filed May 26, 1982, Ser. No. 382,173
Claims priority, application Japan, May 26, 1981, 56-80645
Int. Cl.³ G11B 3/62, 17/02
U.S. Cl. 369—271 7 Claims



1. A record disc stabilizer adapted to be detachably placed on the turntable of a record player for holding a record disc placed thereon attracted thereto for securement; comprising

a disc body having a central bore through which a centering spindle on the turntable extends and having an axial length which is less than the length of the centering spindle, the disc body being centrally formed with an air chamber therein and also having a through-opening formed therein one end of which opens into the outer peripheral end face of the disc body and the other end of which opens into the air chamber;

a valve unit mounted in the through-opening of the disc body adjacent to its outer peripheral end face for selectively connecting the air chamber with a source of negative pressure such as vacuum pump or opening the air chamber to the atmosphere;

an annular elastic outer seal having its one end disposed in close contact with the outer peripheral edge of the record disc and its other end mounted in the upper surface of the disc body adjacent to its outer periphery;

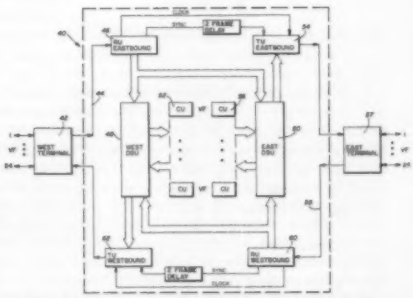
an annular elastic inner seal having its one end disposed in close contact with the surface of the record disc adjacent to the center thereof and its other end mounted in the upper surface of the disc body adjacent to the center thereof, the outer and the inner seal cooperating with the record disc and the upper surface of the disc body to define an air tight space therebetween;

and an air passage for providing a communication between the air chamber and the air space.

4,434,485
DROP AND INSERT CHANNEL BANK WITH REDUCED CHANNEL UNITS

Charles E. Huffman, and Stephen R. Southerland, both of Plano, Tex., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Nov. 13, 1980, Ser. No. 206,497
Int. Cl.³ H04Q 11/04
U.S. Cl. 370—55 16 Claims



7. A channel bank for a transmission system carrying a plurality of multiplexed digital channels on a transmission medium between a pair of terminals, comprising:

receiver means connected to said transmission medium for receiving said channels and comprising demultiplexer means demultiplexing data from said transmission medium into Y buses of X channels each and outputting Y data buses and X channel strobes;

switching means connected to said receiver means for receiving said Y data buses and said X channel strobes, comprising:

N sets of selectors, each set comprising a 1 of X selectors, a 1 of Y selector, and a user controlled channel selector for choosing the 1 of X and 1 of Y selections; and

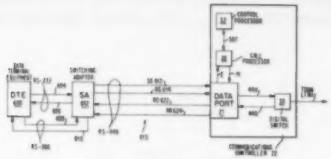
means connecting said X channel strobes to said 1 of X selector in each of said N sets, and connecting said Y data buses to said 1 of Y selector in each of said N sets, each set outputting a single channel strobe and the data from one of said Y buses as respectively chosen by each said channel selector; and

N channel units each connected to the output of a respective one of said N selector sets.

4,434,486
SELF-SWITCHED DATA PORT IN-BAND SIGNALING PROTOCOL

Robert P. Barner, Jr., Rockville; Joseph M. Bensadon, Germantown, both of Md.; Jacques A. Besseyre, Cagnes, France, and Harold G. Markey, Raleigh, N.C., assignors to IBM Corporation, Armonk, N.Y.

Filed Oct. 26, 1981, Ser. No. 314,938
Int. Cl.³ H04J 3/12
U.S. Cl. 370—110.1 **30 Claims**



21. A method for controlling self-switched data port in-band signaling for a TDMA communications controller, for selectively transferring data signals through a data port between a data terminal equipment (DTE) and a TDMA digital switch in said communications controller or transferring control signals between said DTE and a call processor in said communications controller, said DTE including means for selectively outputting dial pulse control signals or data signals on a send data (SD) line connected thereto to said data port and outputting a request-to-send signal on a request-to-send (RS) line connected thereto to said data port, comprising the steps of:

storing in a status register having an input connected to said call processor in said communications controller, a status word output therefrom including a call connection signaling bit, for indicating when said data port is alternately in a call connection state or a data traffic state;

maintaining said E lead input to said call processor in a low state when said RS line is in a low state representing a quiescent state for said data port;

raising an E lead input to said call processor to a high state when said RS line is entering a high state and said signaling bit is in a low state representing said DTE initiating a call request to said data port;

raising said signaling bit to a high state by said call processor, in response to said E lead input, outputting a status word to said status register;

disabling a transmit buffer in response to said high state of said signaling bit, preventing information input on said SD line from being transmitted to said digital switch;

passing call connection dialing pulses from said SD line as E lead input signals to said call processor;

whereby said SD line from said DTE to said data port is selectively switched from a data transfer line connected to said digital switch, to an in-band call connection dial pulse control line connected to said call processor.

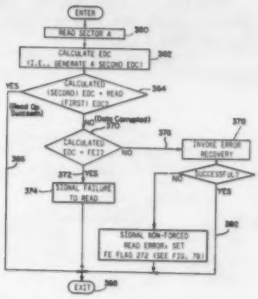
4,434,487
DISK FORMAT FOR SECONDARY STORAGE SYSTEM

Barry L. Rubinson; Mark A. Parenti; Richard F. Lary, and Edward A. Gardner, all of Colorado Springs, Colo., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Oct. 5, 1981, Ser. No. 308,771
Int. Cl.³ G06F 11/10
U.S. Cl. 371—10 **18 Claims**

1. In a secondary storage subsystem (**2**) for a data processing system (**10**), wherein data is recorded on a mass storage medium (**5**) and the smallest addressable unit of the medium is a sector (**9**), each sector including a header field for recording address information and a data field for recording data to be associated with and stored at such address, the improvement comprising:

means (**4**, FIG. **13C-392**) for writing in each sector a predetermined code, termed the forced error indicator, when the data being recorded in the data field is known to be logically corrupted and the medium underlying the sector is not known to be defective; and

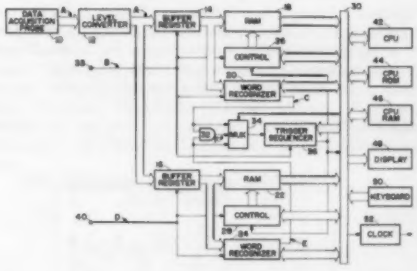


means (**4**, FIG. **13B-374**) for providing a signal, termed a forced error signal, responsive to detection of the forced error indicator during a read operation.

4,434,488
LOGIC ANALYZER FOR A MULTIPLEXED DIGITAL BUS

Steven R. Palmquist, Beaverton; David D. Chapman, Portland, and Gerd H. Hoeren, Lake Oswego, all of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Jun. 8, 1981, Ser. No. 271,345
Int. Cl.³ G09G 1/08
U.S. Cl. 371—15 **6 Claims**



1. A logic analyzer for measuring first and second logic signals transmitted in a time-sharing manner, comprising:

single input means for receiving both said first and second logic signals in sequence;

first memory means coupled to said input means for storing only said first logic signal in accordance with a first strobe signal synchronized with said first logic signal;

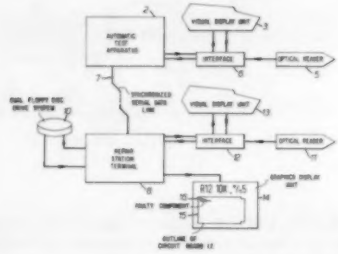
second memory means coupled to said input means for storing only said second logic signal in accordance with a second strobe signal synchronized with said second logic signal; and

control means for controlling write and read operating modes and selection of memory addresses of said first and second memory means.

4,434,489
AUTOMATIC TEST SYSTEMS

Geoffrey C. Blyth, Broxbourne, England, assignor to Marconi Instruments Limited, Chelmsford, England

Filed Oct. 13, 1981, Ser. No. 310,869
Claims priority, application United Kingdom, Oct. 13, 1980, 8033007; Sep. 28, 1981, 8129277
Int. Cl.³ G01R *31/28*
U.S. Cl. 371—29 **14 Claims**

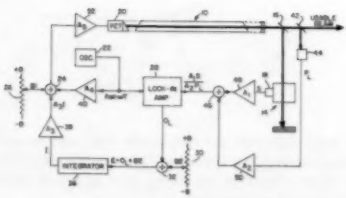


1. An automatic test system for testing and diagnosing faults in an electronic circuit, such as a printed circuit board carrying electronic components, comprising an automatic test apparatus provided to receive said circuit and produce signals indicative of faults therein, means for transmitting said signals to a repair station, means at said repair station for storing data enabling a display consisting of individual component parts of said circuit to be displayed on a display device and means responsive to said fault indicative signals for selecting an appropriate portion of said stored data to cause a component part of said circuit to be displayed on said display device in a position corresponding to the actual position of a component part of said circuit wherein a fault lies and in a fashion in which said displayed component part visually stands out.

4,434,490
SPECTROPHONE STABILIZED LASER WITH LINE CENTER OFFSET FREQUENCY CONTROL

Michael J. Kavaya, San Gabriel, and Robert T. Menzies, Pasadena, both of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Mar. 31, 1982, Ser. No. 364,126
Int. Cl.³ H01S *3/10*
U.S. Cl. 372—20 **13 Claims**



1. A method for continuous tuning of a frequency stabilized cw gas laser over the spectral linewidth of the gas comprising the steps of

dither modulating the frequency of said laser beam about a frequency offset from the absorption line center of said gas, said offset being selectably adjusted for the desired operating region of tuning within the spectral linewidth of the gas,

sensing the dither modulation of said laser beam with the same gas as said laser to produce an output signal proportional to the dithered frequency corresponding to the absorption characteristics of the gas,

detecting a derivative of said output signal,

integrating the detected derivative to produce a correction of said frequency offset, and

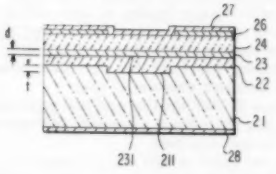
adding an adjustable constant value to said derivative before integrating it as a signal,

whereby the frequency of said laser may be tuned to any frequency over the spectral linewidth of said gas by adjusting said dither frequency offset to a desired operating region within the spectral linewidth of said gas and adjusting said constant value for continuous offset tuning in the desired operating region.

4,434,491
SEMICONDUCTOR LASER

Isamu Sakuma; Katsuhiko Nishida; Hideo Kawano; Masayasu Ueno; Yoshishige Matsumoto; Shohei Matsumoto, and Takao Furuse, all of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Mar. 30, 1981, Ser. No. 248,157
Int. Cl.³ H01S *3/19*
U.S. Cl. 372—48 **8 Claims**

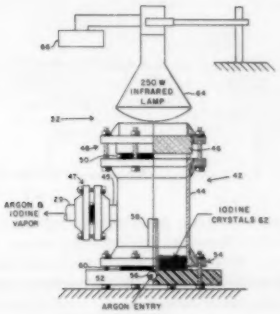


1. Semiconductor laser comprising a semiconductor crystal having a pair of principal surfaces and a pair of reflective end surfaces constituting an optical resonator, a pair of electrodes, and an insulating layer having an opening, said semiconductor crystal including a semiconductor substrate of a first electrical conductivity type and first, second and third semiconductor layers successively grown on said substrate, said substrate having a groove which contacts said first layer and which extends between said pair of reflective end surfaces in a stripe geometry, said first layer being of said first conductivity type and having a narrower band gap than that of said substrate and being formed to provide a substantially flat interface with said second layer and thereby providing a thick portion on said groove and a pair of thinner portions on both sides of said groove, said thick portion extending between said pair of reflective end surfaces along said groove, said thin portions having a thickness not less than the depth of said groove and extending between said pair of reflective end surfaces, said second layer having a narrower band gap than that of said first layer and being formed to provide a substantially flat interface with said third layer and thereby having a uniform thickness, said third layer being of a second conductivity type and having a wider band gap than those of said first and second layers, said insulating layer being provided on one of said principal surfaces on the side of said third layer with said opening aligned with said convex region of said second region, one of said pair of electrodes being provided on said one of said principal surfaces through said opening, and the other of said pair of electrodes being provided on the other of said principal surfaces.

4,434,492
METHOD AND APPARATUS FOR IODINE VAPORIZATION

David J. Benard, Albuquerque; Nicholas R. Pchelkin, Los Lunas; William E. McDermott; David E. Ellis, both of Albuquerque, and George W. Miller, Rio Rancho, all of N. Mex., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 10, 1981, Ser. No. 242,505
Int. Cl.³ H01S 3/22
U.S. Cl. 372—59 4 Claims



1. A gas laser system including a laser apparatus having a lasing cavity, a source of a first active gas mixture connected to said laser apparatus so as to supply said first active gas to said lasing apparatus, an adjustable supply of a carrier gas, an improved vaporizing means connected to said lasing apparatus and said supply of carrier gas for supplying a second active gas that is mixed with said first active gas prior to entry into said lasing cavity to provide a lasing medium therein, said improved vaporizing means comprising:

a. a closed container having an inlet port connected to said supply of carrier gas for receiving a regulated flow of gas therefrom, an outlet port connected to said lasing apparatus, and a window section that is transparent to broad beam visible radiation;

b. I_2 crystal material disposed within said container in a position to receive radiation through said window section; and

c. an adjustable source of infrared radiation mounted so as to direct radiation through said window section into said container to vaporize said I_2 crystal material and form a gas/solid interface therein that provides a source of vapor that mixes with said carrier gas to provide said second active gas supplied to said lasing cavity, said infrared radiation depositing energy at the gas/solid interface to cause the rate of sublimation of said vaporizable I_2 crystal material to respond to changes in radiation intensity to control the flow of said second active gas.

4,434,493
ARGON-ION GAS LASER CATHODE CONSTRUCTION

Edwin G. Chaffee, Salt Lake City, Utah, assignor to American Laser Corporation, Salt Lake City, Utah

Filed Dec. 3, 1981, Ser. No. 327,068
Int. Cl.³ H01S 3/09
U.S. Cl. 372—86 7 Claims

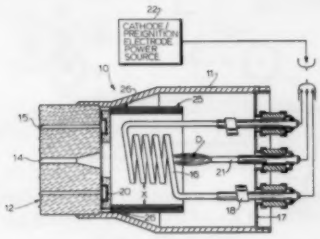
1. In an argon-ion gas laser, in combination:

(a) a cylindrical-shaped laser tube having a central main discharge bore extending lengthwise from a cathode end thereof;

(b) a metal formed end shroud metallically bonded to said cathode end of said tube for reception of a dispenser-type cathode therein;

(c) a dispenser-type coiled cathode supported concentric with the axis of said tube within said shroud proximate said cathode end and formed of an emission mix having a operating life dependent on operating temperature and suited to normally operating within a 900°–1050° C. range with minimal rate of evaporation;

(d) electrode means offset from the axis of said tube and located proximate said cathode and including means operative when said electrode means is energized for establishing preignition in the nature of a localized gas breakdown



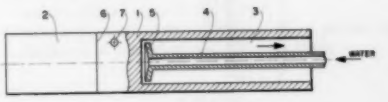
proximate the cathode sufficient to initiate the tube discharge prior to applying full starting power to the laser; and

(e) means for energizing said cathode and preignition electrode means prior to applying full starting power for establishing the main discharge through said tube and for thereafter operating the laser under full power and said cathode within a temperature range of 900°–1050° C.

4,434,494
CONTACT ELECTRODE FOR MELTING AND HEATING FURNACES WITH DC PLASMA HEATING

Herbert Pietzsch, Niederhäslicher Str. 27, DDR-8210 Freital; Walter Lachner, Schlüterstr. 20, DDR-8021 Dresden; Karlheinz Hofmann, Waldblick 17; Erich Pötzsch, Friedrich-Engels-Str. 25a, both of DDR-8210 Freital, and Fred Esser, Wettiner Str. 9, DDR-7010 Leipzig, all of German Democratic Rep.

Filed Feb. 5, 1981, Ser. No. 231,605
Int. Cl.³ H05H 1/26
U.S. Cl. 373—18 2 Claims



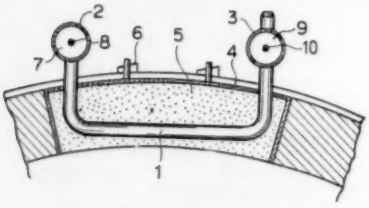
1. A contact electrode for melting and heating furnaces with DC heating, comprising a main body having a bore and an end surface adjacent the closed end of the bore, a flow body composed of a corrosion resistant material for ensuring an intensive cooling of the end surface and comprising a tube receptive of a coolant and having a conically flaring end surface facing the closed end of the bore and a temperature transmitter located on the main body between the end surface of the main body and the end surface of the flow body.

4,434,495

COOLING PIPE STRUCTURE FOR ARC FURNACE

Fumio Tomizawa, Yokohama, and Masayuki Aoshika, Kurihashi, both of Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Japan

Filed May 21, 1982, Ser. No. 380,945
Claims priority, application Japan, Feb. 23, 1982, 57-23650[U]
Int. Cl.³ F27D 1/12
U.S. Cl. 373—76 3 Claims



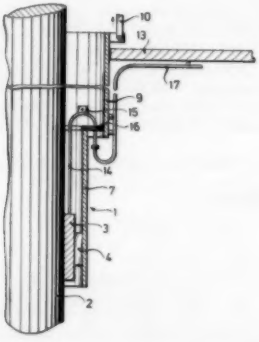
1. A pipe-ladder type water-cooled panel for a wall or a roof of a steel-making arc furnace comprising a group of cooling pipes adjacent to the furnace inside and arranged in a row and in a ladder-form so as not to contact with each other, a space between the adjacent cooling pipes being at least enough for splashed slag to enter, and supporting pipes for supporting said cooling pipes and arranged so as not to be exposed to the furnace inside, said supporting pipes being adapted to have cooling water flow through said cooling pipes sequentially in series while reversing its flow direction at each of said cooling pipes.

4,434,496

HOLDER ASSEMBLY FOR AN ELECTRODE IN AN ELECTROTHERMAL SMELTING FURNACE

Harald Krogsrud, Baerumsveien 447, 1346 Gjettum, Norway

Filed Jul. 9, 1981, Ser. No. 281,687
Claims priority, application Norway, Jul. 25, 1980, 802264
Int. Cl.³ H05B 7/10, 7/11
U.S. Cl. 373—96 8 Claims



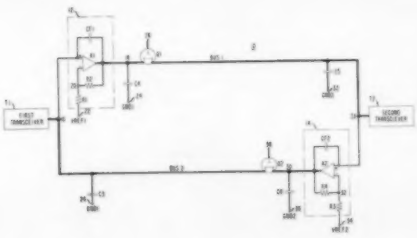
1. A holder assembly for an electrode in an electrothermal smelting furnace, the holder assembly being suspended from a suspension means, the holder assembly comprising: a plurality of contact clamps having pressure producing means disposed adjacent thereto; a cylindrical body externally arranged about the electrode; said contact clamps being arranged between the electrode and said cylindrical body and said pressure producing means being operative to press the contact clamps toward the electrode for holding said electrode; supply means for conducting electrical current, coolant, and pressure agent to said contact clamps; and said supply means also being operative to support the holder assembly on said suspension means.

4,434,497

RESPONSE TIME BIDIRECTIONAL CIRCUITRY

Robert M. Rolfe, Summit, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 22, 1981, Ser. No. 333,445
Int. Cl.³ H04K 5/14
U.S. Cl. 375—7 6 Claims

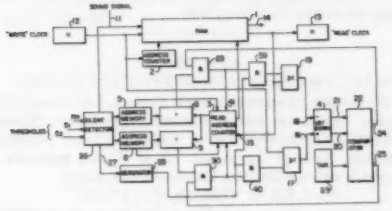


4. A bidirectional communication system comprising:
first and second transceivers;
first and second amplifiers each having at least one input terminal and an output terminal;
first and second capacitance means each having first and second terminals;
first and second switching means each having a control terminal and first and second output terminals;
the first transceiver being coupled to a first input terminal of the first amplifier, to the first terminal of the first capacitance means, to a second output terminal of the second switching means through a second electrical conduit, and to a first system terminal;
the second terminal of the first capacitance means being coupled to the output terminal of the first amplifier, to the first output terminal of the first switching means, and to a second system terminal;
the second transceiver being coupled to a first input terminal of the second amplifier, to the first terminal of the second capacitance means, to a second output terminal of the first switching means through a first electrical conduit, and to a third system terminal;
the second terminal of the second capacitance means being coupled to the output terminal of the second amplifier, to the first output terminal of the second switching device, and to a fourth system terminal;
the first and second switching means being adapted to be coupled by the respective control terminals thereof to control means which selectively allows essentially only one of the switching means to be conductive at a given time;
the gain of the first amplifier and the value of the first capacitance means being selected such that total load capacitance on the input terminal of the first amplifier is less than would be the case if the first capacitance means were not utilized;
the gain of the second amplifier and the value of the second capacitance means being selected such that total load capacitance on the input terminal of the second amplifier is less than would be the case if the second capacitance means were not utilized; and
the first and second switching devices being adapted to be coupled by the respective control terminals thereof to control means which selectively allows essentially only one of the switching means to be conductive at a given time.

4,434,498
PROCESS AND APPARATUS FOR SYNCHRONIZATION OF DIGITAL SIGNALS

Michel Mathieu, Betton, France, assignor to Telediffusion de France, Issy les Moulineaux, France

Filed May 18, 1981, Ser. No. 264,842
Claims priority, application France, May 19, 1980, 80 11139
Int. Cl.³ H04L *7/02*
U.S. Cl. 375—114 **9 Claims**



1. A process for synchronizing a digital signal comprising successive words representing quantized sound information samples and comprising silent periods, with a local reference clock during reconversion from said words to samples, comprising the steps of:

writing the words in a local store in succession as they arrive;

reading said words at the frequency of a local clock;

continuously monitoring the degree of filling of the store;

comparing said degree of filling with a range between predetermined maximum and minimum thresholds;

detecting silent intervals as the presence of successive words having a level between a predetermined maximum value S1 and a predetermined minimum value S2 for a predetermined duration;

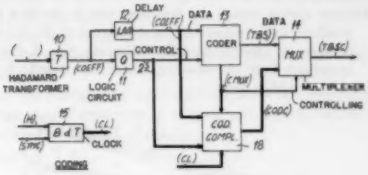
and modifying the contents of the store on appearance of the first silent interval after said degree of filling has passed outside said range, by partially emptying the store of a given number of samples, if the degree of filling is higher than the maximum threshold, and by partially filling the store if the degree of filling is lower than said minimum threshold.

4,434,499
SYSTEM OF NUMERICAL TRANSMISSION WITH ADAPTATIVE CODING, OF ANALOGICAL INFORMATION SAMPLED AND TRANSFORMED BY ORTHOGONAL TRANSFORMATION

Roger Motsch, Mordelles; Francoise Roussel, La Chapelle des Fougeretz, and Germain Lolivier, Rennes, all of France, assignors to L'Etat Francais, represente par le Ministre des P.T.T. (Centre National d'Etudes des Telecommunications) and Etablissement Public de diffusion dit "Telediffusion de France", both of, France

Filed Nov. 13, 1981, Ser. No. 321,005
Claims priority, application France, Nov. 17, 1980, 80 24603
Int. Cl.³ H04B *1/66*
U.S. Cl. 375—122 **4 Claims**

1. A system for transmitting over a data channel digital signals with transmission occurring at a reduced data flow rate and coding accomplished by orthogonal transformation with an adaptative threshold on each scanning of data, the binary elements of the coefficients being obtained by a basic coding of a quantification pitch of 2^S, (S being either a positive or a null of a whole number, the system comprising means for transmitting a complementary coding responsive to adding binary element of weight 2^{S-1} for each one of the coefficients, the adding being up to a maximum capacity of the channel, means for taking said coefficients in chronological order, and means responsive to a null coefficient in the quantification scale of pitch 2^S and to a binary element 2^{S-1} of weight which is

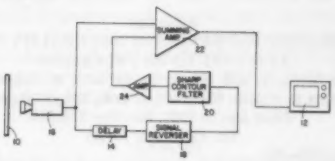


different from zero for further adding a sign binary element representing the coefficient under consideration.

4,434,500
PROCESS FOR STEREOSCOPIC PICTURE REPRODUCTION, IN PARTICULAR IN RESPECT OF X-RAY PICTURES

Norbert Lemke, Puchheim, Fed. Rep. of Germany, assignor to Paul Heitlinger, Nieder-Roden and Fritz Rodder, Waldems, both of, Fed. Rep. of Germany

Filed Nov. 20, 1981, Ser. No. 323,228
Claims priority, application Fed. Rep. of Germany, Jan. 12, 1980, 3045172
Int. Cl.³ A61B *6/00*; G03B *41/16*; H04N *5/22*
U.S. Cl. 378—99 **2 Claims**



1. A process for stereoscopic picture reproduction on an electronic picture screen of a pre-recorded picture, comprising the steps of:

scanning said pre-recorded picture with a television camera to generate an identical pair of electrical picture signals corresponding to each element of said picture;

displacing in time the second signal of said pair relative to the first signal of said pair;

reversing said second signal to cause said second signal to define a reversed image of the picture element to which said second signal originally corresponded;

filtering from said reversed second signal any portions thereof relating to sharp contours of said corresponding picture element;

combining substantially only said first signal and said reversed, filtered second signal; and

transforming said combined signals into a picture element displayed on said electronic picture screen.

4,434,501
X-RAY FILM CASSETTE

Wilfried Pfeiffer, Quickborn, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 378,299, May 14, 1982, abandoned.
This application May 9, 1983, Ser. No. 492,152
Int. Cl.³ G03C *5/16*; G03D *41/16*
U.S. Cl. 378—187 **1 Claim**

1. An X-ray film cassette comprising:

a bottom;

a lid pivotably connected to the bottom, said lid and bottom

defining a storage space therebetween in which an X-ray film can be situated;

a locking mechanism which defines the positions of the lid and the bottom when the cassette is either opened or closed; and

bottom spring means for retaining the X-ray film in a fixed position with respect to the bottom and the lid when the cassette is closed, and for releasing the X-ray film for transport from the cassette when the cassette is opened;

characterized in that:

the cassette further comprises a bottom pressure plate on which X-ray film bears, said bottom pressure plate having dimensions smaller than the dimensions of the X-ray film, an edge region of the X-ray film remaining free to be engaged by transport means;

the bottom spring means brings the X-ray film and the bottom pressure plate to a transport position when the cassette is opened; and

the lid comprises a lid pressure plate and intensifier screen attached thereto, and a lid spring for disengaging the X-ray film and bottom pressure plate from the lid pressure plate and intensifier screen when the cassette is opened.

4,434,502

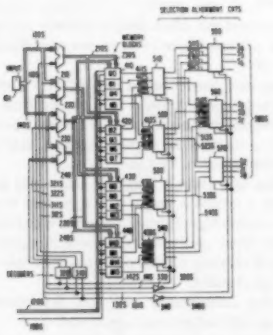
MEMORY SYSTEM HANDLING A PLURALITY OF BITS AS A UNIT TO BE PROCESSED

Takeshi Arakawa, and Hiroki Ikeda, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Apr. 3, 1981, Ser. No. 250,784

Int. Cl.³ G06F *15/20*

U.S. Cl. 382—41 **5 Claims**



1. A memory system for outputting a desired block of data to be displayed on a screen composed of a center bit and bits adjacent to said center bit in response to an address corresponding to said center bit, comprising:

four major memory blocks for storing data to be displayed, each major memory block having a plurality of minor memory blocks containing a plurality of bits, data to be stored in said memory system being divided into four portions, each portion having a plurality of bits and being stored in a respective one of said four major memory blocks;

addressing means operatively coupled to memory inputs of each of said four major memory blocks and receiving said address corresponding to said center bit for producing four addresses for accessing four minor memory blocks adjacent to each other and belonging respectively to said four major memory blocks in response to said address corrsponding to said center bit, said four addresses being applied to said four major memory blocks;

means for reading all data stored in the accessed four minor memory blocks out of said four major memory blocks in response to said four addresses; and

means for arranging said data read out from said accessed four minor memory blocks to produce said desired block and discarding remaining bits.

4,434,503

IMAGE INFORMATION OUTPUT APPARATUS

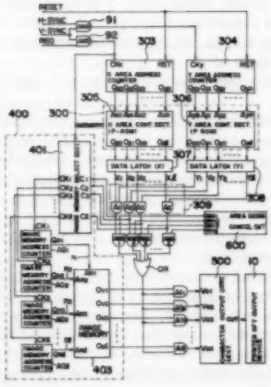
Atsuyuki Tanaka, Shinshiro; Hiroaki Kojima, Toyokawa; Shozo Kaieda, Toyokawa; Tokuji Kakiuchi, Toyokawa; Nobuaki Nishioka, Toyokawa; Yukio Tadauchi, and Hidekazu Nakagami, both of Toyohashi, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jul. 29, 1980, Ser. No. 173,497

Claims priority, application Japan, Jul. 31, 1979, 54-98005

Int. Cl.³ G09G *1/16*; G06K *9/00*

U.S. Cl. 382—48 **5 Claims**



1. An image information output apparatus which is arranged to display patterns of characters and figures as a whole by dividing an image forming plane defined in an X direction and a Y direction into an X-Y matrix configuration having predetermined image units and to generate binary image signals which are used for image formation, each of said image signals respectively corresponding to one of said image units, said image information output apparatus comprising:

a first setting means for setting conditions for a binary "0" or a binary "1" with respect to each of said image units, said first setting means traversing said image forming plane in said X direction;

a second setting means for setting conditions for a binary "0" or a binary "1" with respect to each of said image units, said second setting means traversing said image forming plane in said Y direction;

a means for continuously generating output timing signals in a main scanning direction which corresponds to said X direction;

an AND means operatively connected to said first and second means and said means for generating output timing signals for calculating the logical AND product of two signals set by said first and second setting means so as to output a signal at every generation of said output timing signal;

a means for storing image signals; and

a means operatively connected to said means for storing image signals for outputting said stored image signals, one

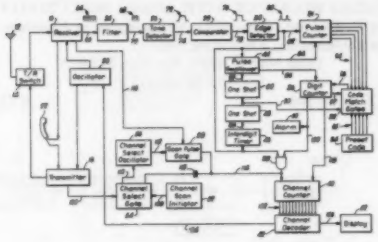
image unit by one image unit, every time said output signal of said AND means becomes equal to a binary "1".

4,434,504

CHANNELING AND DECODE CIRCUIT FOR AIRBORNE RADIO-TELEPHONE SYSTEMS

Dennis L. Fredrickson, Leawood, Kans., assignor to Fredrickson Communications, Inc., Lenexa, Kans.

Filed Jun. 10, 1982, Ser. No. 387,234
Int. Cl.³ H04B *1/00, 7/00;* **H04Q** *7/00*
U.S. Cl. 455—32 **8 Claims**



1. In an air-to-ground radio-telephone system having a ground-based transceiver adapted for transmitting to an airborne transceiver a calling signal in the nature of a sequence of pulses representing an address designation followed by a channel designation each encoded in accordance with a predetermined code, improved means in said airborne transceiver for detecting and decoding said address and channel designations comprising:

means for receiving said calling signal transmitted by said ground-based receiver;

frequency selective filter means coupled with said receiving means for passing only portions of said calling signal of substantially a single predetermined frequency;

detector means coupled with said filter means for providing an electrical output in the nature of pulses corresponding to occurence of only said portions of said calling signal of substantially said single frequency;

means for counting the leading and trailing edges of those of said pulses representing said address designation;

means for counting the leading and trailing edges of those of said pulses representing said channel designation for subsequent setting of said airborne transceiver to an operating channel identified by said channel designation;

means for comparing the count of said edges of said address designation with a preset address designation count representation maintained within said airborne transceiver for sensing the existence or absence of a match therebetween; and

means for enabling said edge counting means for said channel designation only after the existence of a match between said edge count for said address designation and said preset address designation has been sensed.

4,434,505

INTERFERENCE CANCELLING SYSTEM FOR A MOBILE SUBSCRIBER ACCESS COMMUNICATIONS SYSTEM

Frank S. Gutleber, Little Silver, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

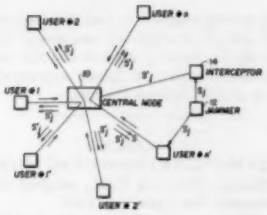
Filed Dec. 1, 1982, Ser. No. 445,800
Int. Cl.³ H04B *15/00*
U.S. Cl. 455—50 **14 Claims**

1. A method of eliminating undesired signals including intentional interference or jamming signals in a mobile subscriber access communications system wherein a plurality of mobile subscriber communication terminals selectively respectively transmit and receive desired signals from one another via a central station which receives and retransmits the desired signals to said terminals in respective signal channels and wherein said terminals additionally receive said undesired signals directly from an interfering signal source in said signal channels, comprising the steps of:

intercepting said undesired signals;

transmitting the intercepted undesired signals to said central station;

relaying the intercepted undesired signals from said central station to said terminals in a separate channel relative to the respective signal channels;



receiving and respectively providing the relayed undesired signal contained in said separate channel and the desired signal plus the directly transmitted undesired signal contained in the signal channel;

adjusting the amplitude and time position of the relayed undesired signal so that it is equal to and coincident in time with the directly transmitted undesired signal; and

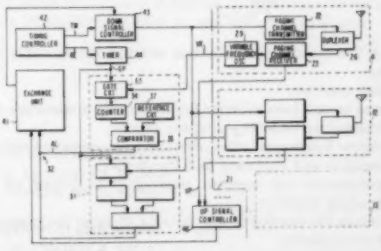
differencing the adjusted and directly transmitted undesired signals whereby they cancel one another leaving the desired signal free of said undesired signal.

4,434,506

CIRCUIT ARRANGEMENT FOR PROTECTING A CONTROL CHANNEL FROM JAMMING WAVES IN A RADIO COMMUNICATION SYSTEM

Ryuhei Fujiwara; Tomokazu Kai, and Hidetoshi Nakahara, all of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Dec. 21, 1981, Ser. No. 332,775
Claims priority, application Japan, Dec. 23, 1980, 55-181366; Dec. 23, 1980, 55-181367
Int. Cl.³ H04B *1/00, 7/00*
U.S. Cl. 455—53 **4 Claims**



1. A circuit arrangement for use in a control station of a radio communication system comprising a plurality of substations each of which is communicable with said control station through radio channels comprising a control channel and a plurality of speech channels, said control channel comprising a down and an up control channel, said down channel being for

supplying said substations with a set of control signals produced in said control station and comprising first and second control signals among which said second control signals are for requesting said substations not to answer said second control signals, said first control signals being for requesting selected ones of said substations to produce answer signals with time intervals left between said answer signals, said up control channel being for successively transmitting the answer signals to said control station from said selected substations, said circuit arrangement comprising:

defining means for defining each time interval between two adjacent answer signals to produce a gate pulse lasting during a first predetermined period when said each time interval is not shoter than said first predetermined period; and

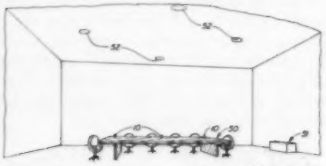
measuring means coupled to said defining means and said second control channel for measuring the intensity of electric field of said up control channel during said first predetermined period to detect occurrence of jamming waves in said up control channel.

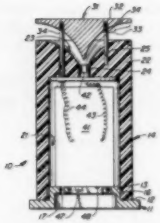
4,434,507

FREE STANDING TRANSMITTING MICROPHONE

Elmer L. Thomas, Placentia, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Aug. 31, 1982, Ser. No. 413,325
Int. Cl.³ H04B 1/034
U.S. Cl. 455—95 **7 Claims**





1. A free standing, transmitting microphone assembly comprising:

a base member;

means in said base member for supporting a miniature radio transmitter including a power supply;

a hollow housing member removably supported on said base member and enclosing said transmitter;

a conductive top member removably supported on said housing member;

means in the interior of said housing member for supporting a microphone;

said housing member and said top member being formed with complimentary acoustic pathway openings for directing acoustic energy toward said microphone from locations generally horizontal with respect to said housing member and top member;

said top member being formed with respect to said means for supporting said microphone in said housing member to substantially prevent acoustic energy from travelling to said microphone from generally vertically above said top member;

means for accommodating a connection between said microphone and said transmitter; and

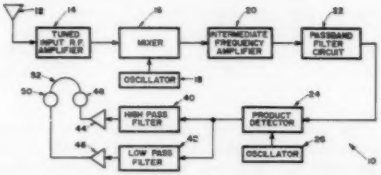
electrically conductive means for accommodating a connection between said transmitter and said conductive top member whereby said top member is electrically energized to function as a radiating antenna for said transmitter.

4,434,508

RADIO RECEIVER WITH AUDIO SELECTIVITY

Robert C. Sommer, Alexandria, Va., assignor to American Systems Corporation, Annandale, Va.

Filed Nov. 3, 1981, Ser. No. 317,913
Int. Cl.³ H04B 1/12
U.S. Cl. 455—306 **6 Claims**



1. A system for detecting a desired signal on a desired channel accompanied by a plurality of undesired signals on a plurality of adjacent channels, each signal comprising a carrier signal with information modulated thereon, each of said carrier signals being of different frequency, comprising:

(a) means for supplying the desired and undesired signals

(b) oscillator means for generating an oscillation signal having a frequency at or near the carrier frequency of said signal;

(c) bandpass means responsive to said supplying means for providing an output composite signal comprising said desired signal and undesired signal components attenuated with respect to said desired signal;

(d) mixer means for heterodyning said composite signal and the output of said oscillator means to produce a mixer output signal, said output signal being the heterodyne products of said oscillator signal with said desired signal and said undesired signal components, respectively, the product of said oscillator signal and said desired signal occupying a desired range of frequencies in the audio range;

(e) first filter means having a first cutoff frequency for receiving the output of said mixer means and passing signals whose frequency is below said first cutoff frequency;

(f) second filter means having a second cutoff frequency for receiving the output of said mixer means and passing signals whose frequency is above said second cutoff frequency, said first and second cutoff frequencies being substantially near the center of said desired range;

(g) first coupling means for passing the output of said first filter means as a first audio signal containing signals with frequencies below said desired range with amplitudes greater than signals above said desired range;

(h) second coupling means for passing the output of said second filter means as a second audio signal containing signals with frequencies above said desired range with amplitudes greater than signals with frequencies below said desired range;

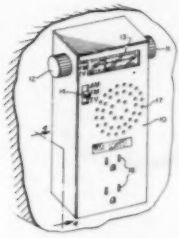
(i) transducer means for providing said first audio signal to one ear of a listener and said second audio signal to the other ear of said listener.

4,434,509

TRANSISTORIZED RADIO RECEIVER COMBINATION WITH MALE POWER INPUT AND FEMALE POWER OUTPUT CONNECTIONS

William J. Schrepel, Alexandria, Va., assignor to PBS Associates, Alexandria, Va.

Filed Aug. 24, 1982, Ser. No. 410,903
Int. Cl.[3] H04B 1/08, 1/16
U.S. Cl. 455—343 4 Claims



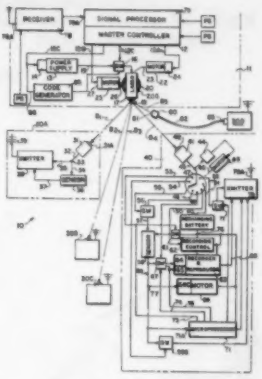
1. A portable lightweight transistorized radio receiver, housed in a plastic casing having a front and a rear, at least two axially spaced male A.C. power input terminals mounted on said rear and at least two female axially spaced A.C. power output terminals mounted on said front and aligned with said terminals on the rear, said radio receiver comprising a 3 band station indicator and a selector switch for FM/AM/TV-FM Mode, said radio receiver being mounted in an upper region of the casing, a step down transformer mounted in the lower region of the casing and electrically connected to a diode and a filter choke in series with a D.C. power input of said receiver, said input terminals each comprising three prongs including a grounding prong, said output terminals each comprising three slots including a grounded slot for receiving these prongs of a male A.C. power input plug of an electrical household appliance including a grounding prong, one of said input terminals being electrically connected to the primary of the transformer and another of said input terminals electrically connected to an output terminal.

4,434,510

COMMUNICATION SYSTEM AND METHOD

Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840

Filed Mar. 10, 1978, Ser. No. 885,268
Int. Cl.[3] H04B 9/00
U.S. Cl. 455—603 10 Claims



1. A communication system comprising:
a central data receiving station,
first means at said central data receiving station for generating an intense radiant energy beam,
an out-station located remote from said central data station,
second means for directing radiant energy from said beam generating means at said central station to said out-station,
third means at said out-station for receiving radiation from said first means,
fourth means connected to said third means including a sensor and means for converting said radiation received from said central data station to electrical energy,
means for applying said electrical energy to power said sensor so as to cause said sensor to sense a variable phenomenon existing in the vicinity of said out-station and to generate an information signal which is indicative of the condition of said varying phenomenon,
fifth means at said out-station for short wave transmitting said information signal to said central data receiving station, said fifth means being connected to receive a portion of the electrical energy converted from radiation received from said central station and to power said fifth means to cause it to transmit information signals generated by said sensor to said central data receiving station, and
sixth means at said central data receiving station for processing information defined by said information signals.

272,769

CYCLIST'S VENTED HELMET

James G. Sundahl, Irvine, and Lester V. Broersma, Bellflower, both of Calif., assignors to Bell Helmets Inc., Norwalk, Calif.

Filed Jul. 6, 1982, Ser. No. 395,824

Term of patent 14 years

Int. Cl. D02—*03*

U.S. Cl. D2—231

272,770

CYCLIST'S VENTED HELMET WITH VISOR

James G. Sundahl, 18 Princeton, Irvine, Calif. 97214, and Lester V. Broersma, 9621 Rose St., Bellflower, Calif. 90706

Continuation-in-part of Ser. No. 395,824, Jul. 6, 1982. This application Oct. 25, 1982, Ser. No. 436,527

Term of patent 14 years

Int. Cl. D02—*03*

U.S. Cl. D2—232

272,771

LOW CUT ATHLETIC SHOE

Roberto Muller Feigelstock, Scarsdale, N.Y., assignor to Pony International, Inc., Secaucus, N.J.

Filed Jun. 17, 1982, Ser. No. 389,335

Term of patent 14 years

Int. Cl. D2—*04*

U.S. Cl. D2—311

272,772

CLEATED SHOE SOLE

Noboru Kohno, Nishinomiya, Japan, assignor to Mizuno Corporation, Osaka, Japan

Filed Mar. 29, 1982, Ser. No. 362,658

Term of patent 14 years

Int. Cl. D2—*04*

U.S. Cl. D2—320

272,773

BELT-ATTACHED BEVERAGE HOLSTER FOR BOTTLES AND CANS

Kenneth A. Weissenburger, 46 Leaman Pl., Lynbrook, N.Y. 11563

Filed Aug. 21, 1981, Ser. No. 294,903
Term of patent 14 years
Int. Cl. D02—*99*
U.S. Cl. D2—400

272,774

BELT-ATTACHED BEVERAGE HOLSTER FOR BOTTLES AND CANS

Kenneth A. Weissenburger, 46 Leaman Pl., Lynbrook, N.Y. 11563

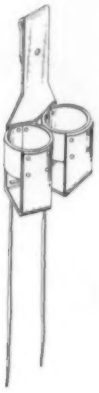
Filed Aug. 21, 1981, Ser. No. 294,904
Term of patent 14 years
Int. Cl. D02—*99*
U.S. Cl. D2—400

272,775

BELT-ATTACHED BEVERAGE HOLSTER FOR BOTTLES AND CANS

Kenneth A. Weissenburger, 46 Leaman Pl., Lynbrook, N.Y. 11563

Filed Aug. 21, 1981, Ser. No. 294,905
Term of patent 14 years
Int. Cl. D02—*99*
U.S. Cl. D2—400



272,776

ATTACHE CASE

Joseph Y. Pelavin, North Bergen, N.J., and Edward M. Stolarz, Yorktown Heights, N.Y., assignors to CPG Products Corp., Minneapolis, Minn.

Filed Mar. 3, 1982, Ser. No. 354,279
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—76

272,777
CHAIR
M. Richard Schultz, Bartow, Pa., assignor to Stow/Davis Furniture Company, Grand Rapids, Mich.
Filed Mar. 12, 1981, Ser. No. 243,207
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—30

272,778
CHAIR
Donald C. Petitt, 207 W. 86th St., New York, N.Y. 10024
Filed Nov. 9, 1981, Ser. No. 319,550
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—31

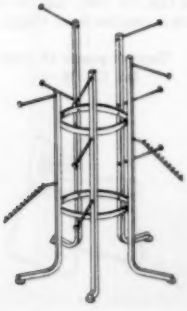
272,779
CHAIR
O. B. Solie, and G. Ronald Sonnenleiter, both of Rockford, Ill., assignors to Simmons Universal Corporation, New York, N.Y.
Filed Dec. 24, 1981, Ser. No. 334,357
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—69

272,780
CHAIR
O. B. Solie, and G. Ronald Sonnenleiter, both of Rockford, Ill., assignors to Simmons Universal Corporation, New York, N.Y.
Filed Dec. 24, 1981, Ser. No. 334,396
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—71

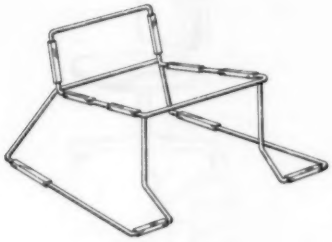
272,781
CHAIR OR SIMILAR ARTICLE
Koni Ochsner, Wettingen, Switzerland, assignor to Giroflex Entwicklungs AG, Koblenz, Switzerland
Filed Dec. 28, 1981, Ser. No. 336,070
Claims priority, application Hague, Sep. 7, 1981, DMA/000087
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—75

272,782
DISPLAY FIXTURE
Robert N. Shelton, 12 Orchard St., Leominster, Mass. 01453
Filed May 16, 1980, Ser. No. 150,535
Term of patent 14 years
Int. Cl. D06—*06*
U.S. Cl. D6—85

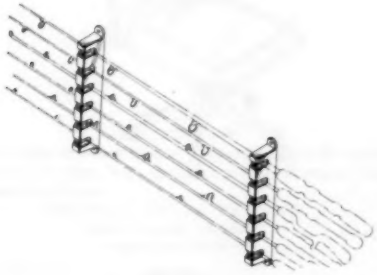
272,783
GARMENT DISPLAY RACK
Daniel E. Gelles, 215 Lexington Ave., New York, N.Y. 10016
Filed Jul. 7, 1981, Ser. No. 281,092
Term of patent 14 years
Int. Cl. D06—*04*
U.S. Cl. D6—85



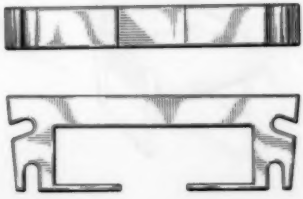
272,784
SPEAKER STAND
Robert E. Williams, Jr., Memphis, Tenn., assignor to Omni R & D, Inc., Memphis, Tenn.
Filed Oct. 22, 1981, Ser. No. 313,788
Term of patent 14 years
Int. Cl. D06—*06*
U.S. Cl. D6—85



272,785
SET OF BRACKETS FOR MOUNTING ON A WALL FOR SUPPORTING HORIZONTALLY ORIENTED FISHING RODS
James T. Rumbaugh, Spirit Lake, Iowa, assignor to Berkley and Company, Inc., Spirit Lake, Iowa
Filed Jan. 4, 1982, Ser. No. 337,090
Term of patent 14 years
Int. Cl. D6—*04*; D8—*08*
U.S. Cl. D6—114



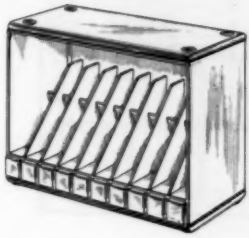
272,786
COMBINED SKI AND POLE RACK
Paul R. McCuiston, 45 Ardmore, Hermosa Beach, Calif. 90254
Filed Dec. 7, 1981, Ser. No. 328,196
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—125



272,787
BRACKET FOR MOUNTING ON A WALL FOR SUPPORTING THE BUTT ENDS OF VERTICALLY ORIENTED FISHING RODS
James T. Rumbaugh, Spirit Lake, Iowa, assignor to Berkley and Company, Inc., Spirit Lake, Iowa
Filed Jan. 4, 1982, Ser. No. 336,882
Term of patent 14 years
Int. Cl. D06—*04*; D8—*08*
U.S. Cl. D6—125

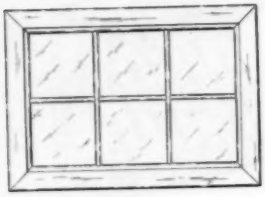
272,788
SUPPORT STAND FOR WORKS OF ART
George Churley, 174 Merry Robin Rd., Troy, Ohio 45373
Filed Mar. 23, 1981, Ser. No. 246,734
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—176

272,789
TAPE RACK
Giotto Stoppino, via Argelati, 30 a, 20143 Milano, Italy
Filed Sep. 9, 1981, Ser. No. 300,513
Claims priority, application Italy, Jul. 13, 1981, 22331/81[U]
Term of patent 14 years
Int. Cl. D06—*04*
U.S. Cl. D6—189

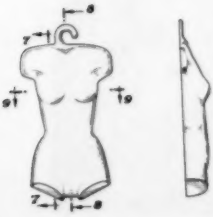


272,790
RUG
Sally G. Irish, R.F.D. 2, Box 172A, Marshall, Va. 22115
Filed Aug. 17, 1981, Ser. No. 293,327
Term of patent 14 years
Int. Cl. D6—*11*
U.S. Cl. D6—210

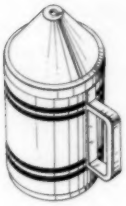
272,791
SIMULATIVE PICTURE FRAME
Jeanette D. Brobakken, 3515 Owasso St., Apt. 302, St. Paul, Minn. 55112
Filed Apr. 9, 1981, Ser. No. 252,370
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—234



272,792
COMBINED GARMENT FORM AND HANGER THEREFOR
Robert S. Marx, 11775 Exposition Blvd., Los Angeles, Calif. 90064
Filed Jun. 7, 1982, Ser. No. 385,432
Term of patent 14 years
Int. Cl. D6—*08*; D7—*05*
U.S. Cl. D6—248



272,793
MUG
Mel Appel, Nine Nottingham Rd., Livingston, N.J. 07039, and George Kress, Scotch Plains, N.J., assignors to Mel Appel, Livingston, N.J.
Filed Feb. 18, 1982, Ser. No. 350,134
Term of patent 14 years
Int. Cl. D07—*01*
U.S. Cl. D7—5



272,794

BEVERAGE CUP

Kenneth B. Dart, Okemos, Mich., assignor to Dart Container Corporation, Mason, Mich.

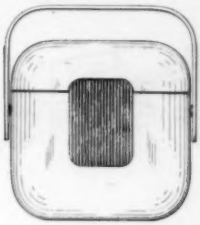
Filed Jun. 22, 1981, Ser. No. 276,020
Term of patent 14 years
Int. Cl. D07—*01*
U.S. Cl. D7—6

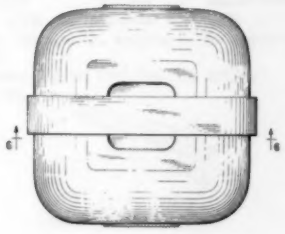
272,795

ICE-BUCKET

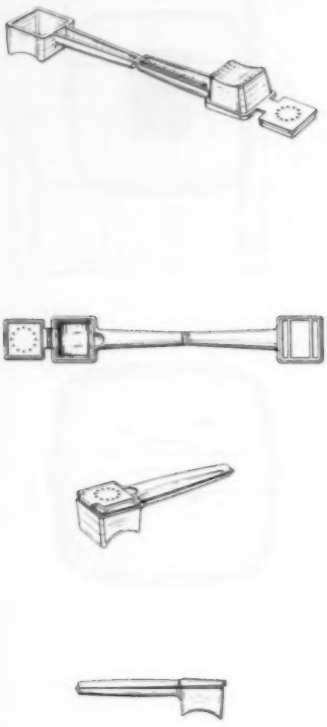
Ambrogio Pozzi, Gallarate, Italy, assignor to F. Lli Guzzini S.p.A., Recanati, Italy

Filed Mar. 30, 1981, Ser. No. 248,891
Claims priority, application Italy, Sep. 29, 1980, 22951/80[U]
Term of patent 14 years
Int. Cl. D07—*01*
U.S. Cl. D7—78





272,796
COMBINED CORN BUTTERER AND SALT DISPENSER
Martin J. Wolff, North Providence, R.I., assignor to Dart Industries Inc., Northbrook, Ill.
Filed Aug. 3, 1981, Ser. No. 289,270
Term of patent 14 years
Int. Cl. D07—*04*
U.S. Cl. D7—99



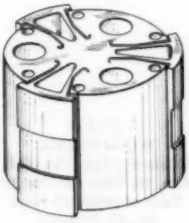
272,797
SERVING DISPENSER FOR HONEY OR THE LIKE
Priscilla D. Silva, 7706 Yeazell Rd., Longbranch, Wash. 98351
Filed Apr. 12, 1982, Ser. No. 330,034
U.S. Cl. D7—302

272,798
SLIDING HAMMER
Jerry L. York, 1821 Alan-A-Dale, Arlington, Tex. 76013
Filed Jan. 29, 1982, Ser. No. 343,776
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—1

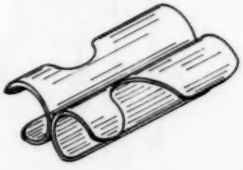
272,799
SHOVEL BLADE
Paul D. Pluss, 3617 Valley Vista Rd., Bonita, Calif. 92002
Filed Apr. 16, 1982, Ser. No. 369,245
U.S. Cl. D8—10

272,800
PULL
Valentin Pawlow, Rockford, Ill., assignor to Keystone Consolidated Industries, Inc., Peoria, Ill.
Filed Dec. 21, 1981, Ser. No. 333,034
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—318

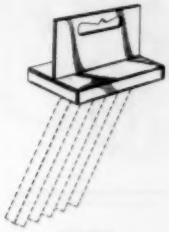
272,801
FLEXURE HINGE FOR GYROSCOPES OR THE LIKE
Shri A. Kumar, Parsippany; Bo Ljung, and James G. Koper, both of Wayne, all of N.J., assignors to The Singer Company, Little Falls, N.J.
Filed Jun. 22, 1981, Ser. No. 275,804
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—325



272,802
PENLIGHT HOLDER
Dennis P. Dall-Winther, R.R. #4, Mason City, Iowa 50401
Filed Feb. 22, 1982, Ser. No. 350,428
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—396

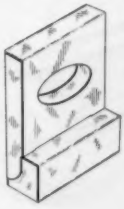


272,803
PACKAGING CONTAINER FOR RAZORS
Richard D. Richards, Liphook, England, assignor to Wilkinson Sword, Limited, England
Filed May 28, 1981, Ser. No. 270,690
Claims priority, application United Kingdom, Dec. 5, 1980, 997931
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—342



272,804
JAR, OR SIMILAR ARTICLE
Morris Braun, Chicago, Ill., assignor to W. Braun Company, Chicago, Ill.
Filed Jan. 18, 1982, Ser. No. 339,907
U.S. Cl. D9—353

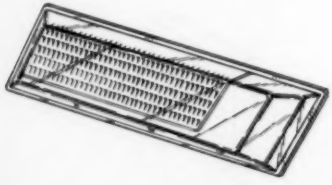
272,805
CONTAINER FOR A PIZZA KIT
Dell E. Johnsen, Kearney, Mo., assignor to Dells, Inc., Kansas City, Mo.
Filed Oct. 15, 1981, Ser. No. 311,529
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—415



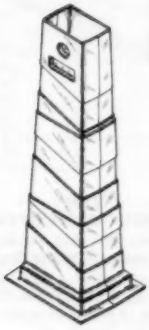
272,806
PACKAGING CONTAINER
Binns Handy, West Henrietta, and David O. Chase, Skaneateles, both of N.Y., assignors to Lenox Incorporated, Lawrenceville, N.J.
Filed May 26, 1981, Ser. No. 267,268
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—416

272,807
DISPENSING CLOSURE PLUG
Gerald F. Ruhl, Greenville, Ohio, assignor to Replicap Products, Inc., Greenville, Ohio
Filed Sep. 8, 1981, Ser. No. 299,890
Term of patent years
Int. Cl. D9—*07*
U.S. Cl. D9—449

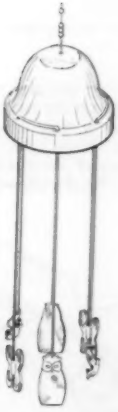
272,808
SIDE REFLECTOR FOR AUTOMOBILE
Claus Luthe, Munich; Manfred Rennen, Ingolstadt, and Hans Braun, Lohhof, all of Fed. Rep. of Germany, assignors to Bayerische Motoren Werke Aktiengesellschaft, Munich, Fed. Rep. of Germany
Filed Mar. 27, 1981, Ser. No. 248,360
Claims priority, application Fed. Rep. of Germany, Sep. 30, 1980, MR 12271
Term of patent 14 years
Int. Cl. D10—*06*; D26—*06*
U.S. Cl. D10—111



272,809
TRAFFIC CONTROL MARKER
James A. Bent, 5002 Churchill, Westminster, Calif. 92683, and Bruce C. Bent, 11791 Paseo Bonita, Los Alamitos, Calif. 90720
Filed Feb. 18, 1982, Ser. No. 349,727
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—109



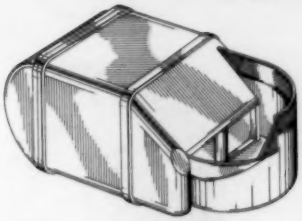
272,810
WIND CHIME
Vern Stilson, 4006 Main St., Erie, Pa. 16511
Filed Oct. 10, 1980, Ser. No. 196,106
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—116



272,811
RING
Marina Bulgari, Athens, Greece, assignor to Zoldia Anstalt, Vaduz, Liechtenstein
Filed Oct. 9, 1981, Ser. No. 310,322
Claims priority, application Italy, Apr. 13, 1981, 35737/81[U]
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—34

272,812
MOSQUITO FIGURE
Tatsuya Kodaka, 25-6, Wakamiya 1-chome, Nakano-ku, Tokyo, Japan
Filed Nov. 12, 1981, Ser. No. 320,738
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—162

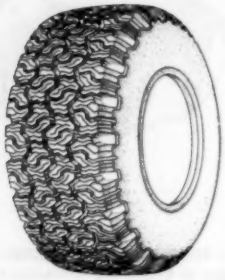
272,813
REFUSE TRUCK BODY
John W. Pickrell, Scottsdale, Ariz., assignor to Government Innovators, Inc., Phoenix, Ariz.
Filed Mar. 12, 1981, Ser. No. 243,080
Term of patent 14 years
Int. Cl. D12—*13*
U.S. Cl. D12—15



272,814
BICYCLE NOISE MAKER
Dwight L. Darling, 67 Church St., Brockville, Ontario, Canada
Filed Jun. 8, 1981, Ser. No. 271,093
Claims priority, application Canada, May 27, 1981, 27-05-81-8
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—114

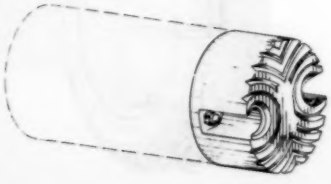
272,815
TIRE FOR A VEHICLE WHEEL
Kenji Hatakenaka, Kobe, Japan, assignor to Dunlop Limited, London, England
Filed Aug. 20, 1981, Ser. No. 294,621
Claims priority, application Japan, Feb. 26, 1981, 56-7839
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—146

272,816
TIRE
Carl D. Birkel, Tallmadge, Ohio, and David A. Wright, Louisville, Colo., assignors to The B. F. Goodrich Company, Akron, Ohio
Filed Oct. 28, 1981, Ser. No. 315,847
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—147

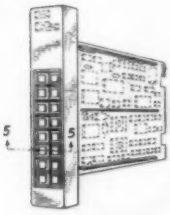


272,817
VEHICLE SIDE RAIL
Ray G. Mareydt, Warren, Mich., assignor to Four Star Corporation, Troy, Mich.
Filed Jun. 15, 1981, Ser. No. 274,024
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—155

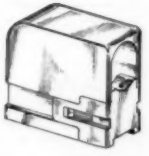
272,818
VOLTAGE REGULATOR HOUSING FOR END MOUNTING ON A GENERATOR
Frank D. Worsham, 61 Highland Ave., Concord, N.C. 28205
Filed Aug. 31, 1981, Ser. No. 297,754
Term of patent 14 years
Int. Cl. D13—*02*
U.S. Cl. D13—11



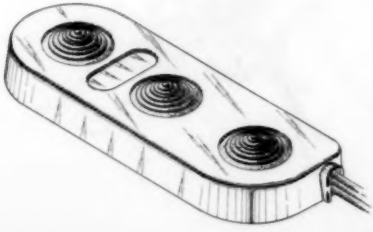
272,819
CONTROL SYSTEM MODULE FOR MOUNTING IN A CONTROL PANEL
Thomas R. Bean, Concord Township; Edward F. Stockmaster, Mentor, and George S. Whaley, Eastlake, all of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.
Filed Apr. 30, 1981, Ser. No. 258,982
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—12



272,820
90° CABLE STRAIN RELIEF AND ELECTRICAL CONNECTOR COVER
Pete Cosmos, and Earl W. McCleerey, both of Mechanicsburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.
Filed Sep. 28, 1981, Ser. No. 306,842
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—24

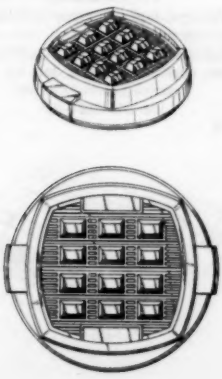


272,821
AIR SWITCH
Charles M. Perethian, Santa Margarita, Calif., assignor to California Cooperage, San Luis Obispo, Calif.
Filed Sep. 25, 1981, Ser. No. 305,615
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—12

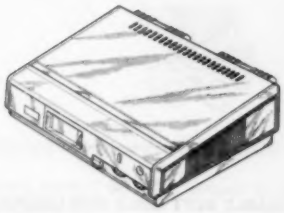


272,822
SWITCH
Wolfgang F. Bienwald, Melville, and David B. Balaban, Douglaston, both of N.Y., assignors to Leviton Manufacturing Company, Inc., Little Neck, N.Y.
Filed Oct. 7, 1981, Ser. No. 309,316
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—32

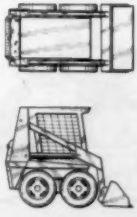
272,823
TONE GENERATOR MOUTHPIECE CONSOLE
Kenichi Fukunaga, San Jose, Calif., assignor to Buscom Systems, Inc., Santa Clara, Calif.
Filed Nov. 9, 1981, Ser. No. 319,564
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—66



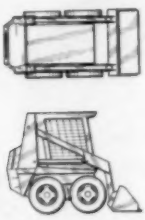
272,824
RADIO APPARATUS
Michael J. McGourty, Littleport, England, assignor to Pye (Electronic Products) Limited, Cambridge, England
Division of Ser. No. 10,878, Feb. 9, 1979, Pat. No. Des. 264,969.
This application Mar. 1, 1982, Ser. No. 353,700
Claims priority, application United Kingdom, Aug. 11, 1978, 985888; Aug. 11, 1978, 985889
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—71



272,825
SKID STEER LOADER
Gary L. Cochran; Gary D. Stromberg; James E. Dawson, all of Burlington, Iowa; Ralph C. Lanphere, Racine, Wis., and Maurice Klee, Burlington, Iowa, assignors to J. I. Case Company, Racine, Wis.
Filed Oct. 26, 1981, Ser. No. 314,895
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D15—25

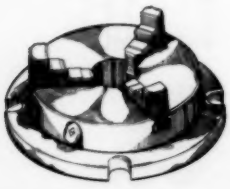


272,826
SKID STEER LOADER
Gary L. Cochran; Gary D. Stromberg; James E. Dawson, all of Burlington, Iowa; Ralph C. Lanphere, Racine, Wis., and Maurice Klee, Burlington, Iowa, assignors to J. I. Case Company, Racine, Wis.
Filed Oct. 26, 1981, Ser. No. 314,904
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D15—25



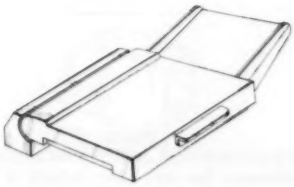
272,827
DETACHABLE BUTT GRILL FOR GRAPPLE ARCH
Ronald Sapelak, Belmont, Canada, assignor to Clark Equipment Company, Buchanan, Mich.
Filed Jun. 17, 1981, Ser. No. 275,087
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D15—28

272,828
CHUCK
Hisao Negoro, 335 Oaza-Okubo Kumatori-cho, Sennan-gun, Osaka, Japan
Filed May 22, 1981, Ser. No. 266,377
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D15—140

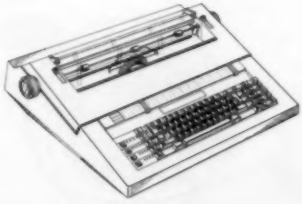


272,829
CAMERA
Takaharu Kato, Tokyo, Japan, assignor to Ricoh Company, Ltd., Japan
Filed Nov. 19, 1981, Ser. No. 323,030
Claims priority, application Japan, May 22, 1981, 56-22040
Term of patent 14 years
Int. Cl. D16—*01*
U.S. Cl. D16—8

272,830
ORIGINAL FEEDER FOR COPYING MACHINE
Kunio Hara, Chiba, and Shigeki Yasutani, Kashiwa, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan
Filed Jul. 16, 1981, Ser. No. 284,134
Claims priority, application Japan, Jan. 19, 1981, 56-1003
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D16—32



272,831
TYPEWRITER
Mitsuru Iseki, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan
Filed May 21, 1982, Ser. No. 380,567
Claims priority, application Japan, Jan. 22, 1982, 57-2396
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D18—1



272,832

FOUNTAIN PEN

Jean G. Malamoud, Saint-Jorioz, France, assignor to S. T. DuPont, Paris, France

Filed Aug. 8, 1980, Ser. No. 176,446

Claims priority, application France, Feb. 20, 1980, 800443

Term of patent 14 years

Int. Cl. D19—*06*

U.S. Cl. D19—51

272,833

DISPLAY SURFACE OF THE DRUG EFFECT ON BRAIN CAPILLARY BLOOD FLOW AND NERVE IMPULSE TRANSMISSION DEMONSTRATOR

Daniel van Assche, 69 rue des Vosges, Buschwiler, France; Claude Birgy, 4/7 Weihermattstrasse, CH-4410 Liestal, Switzerland; Armin Kessler, 17 Im Rehwechsel, CH-4102 Binningen, Switzerland, and Gernot Gmelin, 35/7 Fraumattstrasse, CH-4410 Liestal, Switzerland

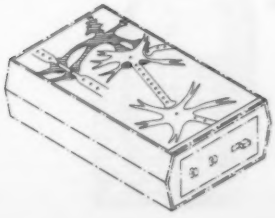
Continuation-in-part of Ser. No. 9,700, Feb. 5, 1979, abandoned. This application Nov. 4, 1981, Ser. No. 318,215

Claims priority, application United Kingdom, Aug. 3, 1978, 32169/78

Term of patent 14 years

Int. Cl. D19—*07*

U.S. Cl. D19—62



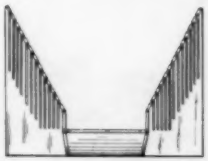
272,834

TEMPLATE ORGANIZER STAND

William H. Moore, 212 Redwood Dr., Elk Grove Village, Ill. 60007

Filed Sep. 18, 1981, Ser. No. 303,350

U.S. Cl. D19—75



272,835

LOWER HOUSING FOR A CONTROL UNIT FOR A VIDEO GAME

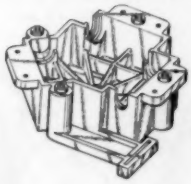
Gerald J. Lichac, Santa Cruz, Calif., assignor to Atari, Inc., Sunnyvale, Calif.

Filed Nov. 9, 1981, Ser. No. 319,020

Term of patent 14 years

Int. Cl. D21—*01*

U.S. Cl. D21—48



272,836

MAGNETIC DISC SPINNING TOY

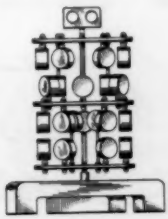
Milton E. B. Lenk, Rte. 5, Box 636, Oklahoma City, Okla. 73108

Filed Sep. 11, 1981, Ser. No. 301,168

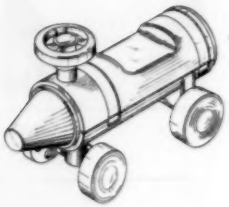
Term of patent 14 years

Int. Cl. D21—*01*

U.S. Cl. D21—59

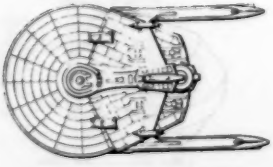


272,837
RIDE-ON TOY
Mel Appel, Nine Nottingham Rd., Livingston, N.J. 07039, and George Kress, Scotch Plains, N.J., assignors to Mel Appel, Livingston, N.J.
Filed Dec. 3, 1981, Ser. No. 327,121
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—71

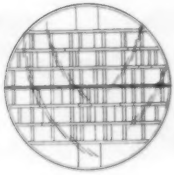


272,838
TOY ROCKING HORSE
Timothy A. O'Connell, 12625 W. Atlantic Pl., Lakewood, Colo. 80228
Filed Jul. 6, 1981, Ser. No. 280,376
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—75

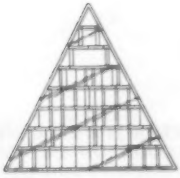
272,839
TOY SPACESHIP
Joseph R. Jennings, Studio City, and Michael Minor, Los Angeles, both of Calif., assignors to Paramount Pictures Corporation, New York, N.Y.
Filed Jun. 7, 1982, Ser. No. 385,983
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—87



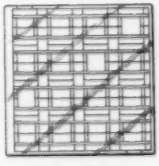
272,840
PUZZLE
Teruo Matsumoto, Tokyo, Japan, assignor to Epoch Company, Ltd., Tokyo, Japan
Filed Nov. 20, 1981, Ser. No. 323,687
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—104



272,841
PUZZLE
Teruo Matsumoto, Tokyo, Japan, assignor to Epoch Company, Ltd., Tokyo, Japan
Filed Nov. 20, 1981, Ser. No. 323,688
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—104

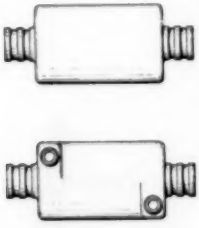


272,842
PUZZLE
Teruo Matsumoto, Tokyo, Japan, assignor to Epoch Company, Ltd., Tokyo, Japan
Filed Nov. 20, 1981, Ser. No. 323,689
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—104



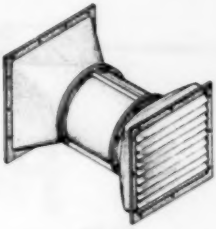
272,843
DOLL
Mel Appel, 9 Nottingham Rd., Livingston, N.J. 07039, and George Kress, Scotch Plains, N.J., assignors to Mel Appel, Livingston, N.J.
Filed Feb. 18, 1982, Ser. No. 349,987
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—175

272,844
DIESEL FUEL WARMER
Gordon L. Kelling, Minnetonka, Minn., assignor to Phillips Temro, Inc., Eden Prairie, Minn.
Filed Mar. 30, 1981, Ser. No. 249,076
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—77



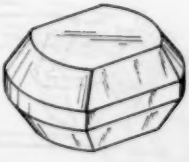
272,845
SOLID FUEL STOVE
David Wolfe, Brockwood Park, Bramdean near Alresford, Hampshire, England (S0240LQ)
Filed Apr. 6, 1981, Ser. No. 251,307
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—97

272,846
FAN HOUSING FOR GRAIN DRYERS
Robert J. McVicker, and Wilford R. Mann, both of Niles, Mich., assignors to AAA Associates, Inc., Niles, Mich.
Filed Aug. 10, 1981, Ser. No. 291,225
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—139



272,847
CERAMIC BRIQUETTE FOR A COOKING GRILL
Walter Koziol, Russell, Ill., assignor to Modern Home Products Corp., Antioch, Ill.
Filed Dec. 16, 1981, Ser. No. 331,192
Term of patent 14 years
Int. Cl. D23—*05*
U.S. Cl. D23—166

272,848
CERAMIC BRIQUETTE FOR A COOKING GRILL
Walter Koziol, Russell, Ill., assignor to Modern Home Products Corp., Antioch, Ill.
Filed Dec. 16, 1981, Ser. No. 331,194
Term of patent 14 years
Int. Cl. D23—*05*
U.S. Cl. D23—166



272,849

ENDOSCOPE AND AN ACCOMPANYING EYEPIECE

Roger P. Bel, Massy, and Martial E. Hascoet, Paris, both of France, assignors to Metallisations et Traitements Optiques M.T.O., Massy, France

Filed Sep. 30, 1981, Ser. No. 307,221

Term of patent 14 years

Int. Cl. D24—*02*

U.S. Cl. D24—18

272,850

DRIP CHAMBER SPIKE

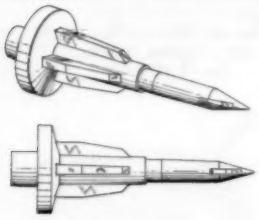
Lee K. Kulle, Mundelein, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Aug. 3, 1981, Ser. No. 289,684

Term of patent 14 years

Int. Cl. D24—*04, 02*

U.S. Cl. D24—24



272,851

LINEAR ANASTOMOSIS STAPLER

David T. Green, Norwalk; Paul O. Rawson, Easton, and Richard Yagami, Bridgewater, all of Conn., assignors to United States Surgical Corporation, Norwalk, Conn.

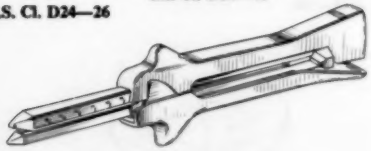
Filed Jun. 3, 1981, Ser. No. 270,274

Claims priority, application Australia, Jan. 9, 1981, 83,124; Jan. 9, 1981, 83,125; Canada, May 12, 1981, 12-05-81-4

Term of patent 14 years

Int. Cl. D24—*02*

U.S. Cl. D24—26



272,852

LINEAR ANASTOMOSIS STAPLER

David T. Green, Norwalk; Paul O. Rawson, Easton, and Richard Yagami, Bridgewater, all of Conn., assignors to United States Surgical Corporation, Norwalk, Conn.

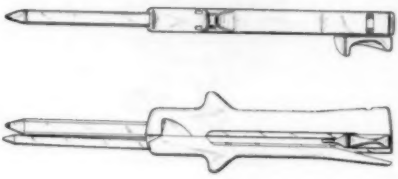
Filed Jun. 3, 1981, Ser. No. 270,278

Claims priority, application Australia, Dec. 19, 1980, 82,883; Dec. 19, 1980, 82,884; Canada, May 12, 1981, 12-05-81-4

Term of patent 14 years

Int. Cl. D24—*02*

U.S. Cl. D24—26



272,853

TIBIAL RESECTION GUIDE

Frederick F. Buechel, 112 Orange Ave., Irvington, N.J. 07111; Michael J. Pappas, 61 Gould Pl., Caldwell, N.J. 07006, and Paul A. Witte, 157 N. Main St., New Hope, Pa. 18938

Filed Dec. 31, 1981, Ser. No. 336,044
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—26

272,854

DISTAL FEMORAL RESECTION GUIDE

Paul A. Witte, 157 N. Main St., New Hope, Pa. 18938; Frederick F. Buechel, 112 Orange Ave., Irvington, N.J. 07111, and Michael J. Pappas, 61 Gould Pl., Caldwell, N.J. 07006

Filed Dec. 31, 1981, Ser. No. 336,045
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—26

272,855

BIOPSY FORCEPS

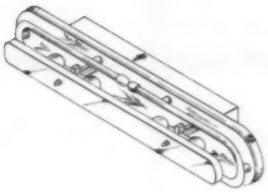
Roger P. Bel, Massy; Martial E. Hascoet, Paris, and Michel M. Regnier, Ris Orangis, all of France, assignors to Metallisations et Traitements Optiques M.T.O., Massy, France

Filed Sep. 30, 1981, Ser. No. 307,219
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—28

272,856
STOPPER FOR TEST TUBES AND THE LIKE
Edward P. Percarpio, North Haledon, N.J., assignor to Becton Dickinson and Company, Paramus, N.J.
Filed Feb. 16, 1982, Ser. No. 349,337
U.S. Cl. D24—99

272,857
SAFETY CLAMP FOR LADDERS
Kant F. Leach, 4395 S. Galapago St., Englewood, Colo. 80110
Filed Nov. 30, 1981, Ser. No. 325,779
Term of patent 14 years
Int. Cl. D6—*99*; D8—*08*
U.S. Cl. D25—68

272,858
LIGHT FIXTURE
James J. Palka, Arlington Heights, Ill., assignor to Pace Industries Inc., Chicago, Ill.
Filed Oct. 5, 1981, Ser. No. 308,445
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D26—80



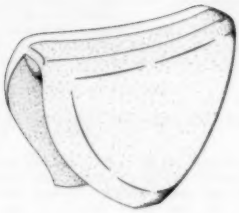
272,859
LIGHTER
Giovanni Bulgari, Rome, Italy, assignor to Anthos S.A., Geneva, Switzerland
Filed Dec. 18, 1981, Ser. No. 332,329
Claims priority, application 07281981, Jul. 28, 1981, DM/000887
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D27—42

272,860

NECK CUSHIONING PAD FOR SINK EDGE

Lillian Swatzell, Homer, Ak., assignor to Lilaud Products, Coeur d'Alene, Id.

Filed Aug. 19, 1981, Ser. No. 294,289
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—20

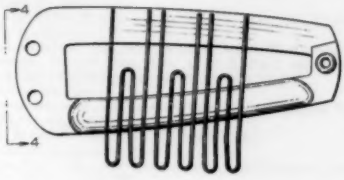


272,861

CLIP FOR SECURING HAIRPIECE TO NATURAL HAIR

Peter A. Incando, 8907 Valley Blvd., Rosemead, Calif. 91770

Filed Feb. 1, 1982, Ser. No. 344,373
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—93

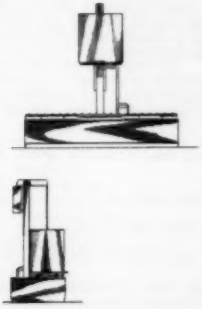


272,862

ENGINE WASHING AND CLEANING APPARATUS

Bero Burghard, and Helmut Schauer, both of 1243 Dorion St., Montreal, Quebec, Canada (H2K 4A2)

Filed Apr. 30, 1981, Ser. No. 259,244
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D32—4

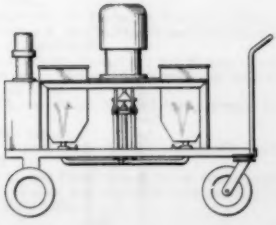


272,863

MOBILE MATERIAL DELIVERY CART

Sam D. McMullen, Houston, Tex., assignor to Matcote Company, Inc., Houston, Tex.

Filed Sep. 14, 1981, Ser. No. 302,136
Term of patent 14 years
Int. Cl. D12—*02*
U.S. Cl. D34—17



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 28TH DAY OF FEBRUARY, 1984

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A/S Haustrup Plastic: *See*—
Ingemann, Ole, 4,433,793, Cl. 220-276.000.

Abbondante, Thomas S.: *See*—
Sellet, Frederick; George, Guerino F.; and Abbondante, Thomas S., 4,433,899, Cl. 350-307.000.

Abbott, Jerry J.; Crossan, Stephen C.; Fuller, Sterritt R., Jr.; and Jachimiak, Paul D., to International Business Machines Corporation. Electrophotographic toner and carrier. 4,434,220, Cl. 430-108.000.

Abbott Laboratories: *See*—
Unger, John T., 4,434,227, Cl. 435-7.000.

Abe, Hiromichi: *See*—
Kojima, Masaaki; Suzuki, Takayuki; and Abe, Hiromichi, 4,433,897, Cl. 350-252.000.

Abe, Osamu: *See*—
Amano, Matsuo; Teranishi, Takao; Mouri, Yasunori; Abe, Osamu; and Sasayama, Takao, 4,433,650, Cl. 123-179.00G.

Abe, Seiko; Igashira, Toshihiko; Kawai, Hisasi; Ina, Toshikazu; and Tokoro, Masayoshi, to Nippon Soken, Inc.; and Toyota Jidosha Kogyo Kabushiki Kaisha. Device for controlling choke valve in carburetor for internal combustion engine. 4,433,665, Cl. 123-552.000.

Abeyama, Shozo: *See*—
Kato, Tetsuo; Abeyama, Shozo; Kimura, Atsuyoshi; Sekiya, Shigenobu; and Nakamura, Sadayuki, 4,434,006, Cl. 75-123.00R.

Abt, Reinhold; Blum, Walter; and Bordovsky, Jaromir, to Daimler-Benz Aktiengesellschaft. Power steering system for motor vehicles. 4,433,613, Cl. 91-358.00R.

Achelpohl, Fritz: *See*—
Mundus, Friedhelm; and Achelpohl, Fritz, 4,433,599, Cl. 83-87.000.

Achorn, George S., to Atlantic Richfield Company. High swell resins. 4,434,279, Cl. 526-66.000.

Achtenberg, Theo: *See*—
Sattlegger, Hans; Schnurrbusch, Karl; Degen, Bruno; and Achtenberg, Theo, 4,434,283, Cl. 528-34.000.

Acufex Microsurgical, Inc.: *See*—
Burke, Roger M.; DeSatnick, Allen H.; and Honkanen, George P., 4,433,687, Cl. 128-318.000.

Adams, John M., to Philip Morris Incorporated. Variable dilution filter. 4,433,696, Cl. 131-336.000.

Adams, Lonnie D.; and Sammons, David W., to Upjohn Company, The. Method and kit for silver staining substances supported in matrix. 4,434,234, Cl. 436-86.000.

Afdasta, Nader. Remote controlled camera operating device. 4,433,903, Cl. 354-266.000.

Agence Nationale de Valorisation de la Recherche: *See*—
Bisagni, Emile; Ducrocq, Claire; Rivalle, Christian; Tambourin, Pierre; Wendling, Francoise; Civier, Alain; Montagnier, Luc; Chermann, Jean-Claude; Gruest, Jacqueline; and Lidereau, Rosette, 4,434,290, Cl. 546-70.000.

Agip Petroli S.p.A.: *See*—
Colombo, Edilberto, 4,434,291, Cl. 548-116.000.

Aida Engineering, Ltd.: *See*—
Nakano, Koji; and Katanaga, Kenji, 4,433,465, Cl. 29-415.000.

Air Products and Chemicals, Inc.: *See*—
Deeba, Michel; Ambs, William J.; and Cochran, Robert N., 4,434,300, Cl. 564-479.000.

Aisan Industry Co., Ltd.: *See*—
Teramura, Mitsuyoshi; Takimoto, Masatami; Nakamura, Norihiko; Itou, Takaaki; Katou, Takashi; Yasuda, Takeru; and Kitamura, Sunao, 4,434,111, Cl. 261-44.00C.

Aisin Seiki Kabushiki Kaisha: *See*—
Hashimoto, Nobuyuki; and Hattori, Takemi, 4,433,708, Cl. 141-114.000.

Aitcin, Pierre C., to Universite De Montreal. Process for manufacturing cordierite compositions. 4,434,239, Cl. 501-118.000.

Aiwa Co., Ltd.: *See*—
Kanno, Akira, 4,433,805, Cl. 228-180.00R.

Akasaka, Hideki: *See*—
Takahashi, Yosuke; Akasaka, Hideki; Kasui, Toshikatsu; Niwa, Tatsuo; and Sukegawa, Tsuneo, 4,433,901, Cl. 350-357.000.

Akashi, Kazuya: *See*—
Gomi, Yoshiaki; Hirata, Takahiro; Takaoka, Michio; Mohtai, Tsuneaki; and Akashi, Kazuya, 4,434,319, Cl. 174-13.000.

Akzo N.V.: *See*—
Kessler, Erich, 4,434,250, Cl. 521-64.000.

Akzona, Inc.: *See*—
Beck, Heinz; Holtvoigt, Werner; and Mukerjee, Ambar, 4,434,260, Cl. 524-104.000.

Albany International Corp.: *See*—
Nicholson, Charles B., 4,434,055, Cl. 210-489.000.
Poisson, William H., 4,433,493, Cl. 34-116.000.

Alkem GmbH: *See*—
Stoll, Wolfgang; and Ledebrink, Wilhelm, 4,434,137, Cl. 423-6.000.

All-Lock Electronics, Inc.: *See*—
Roland, Manfred W., 4,433,487, Cl. 33-174.00F.

Allardt, Clark E.: *See*—
Hagelberg, Allen C.; and Allardt, Clark E., 4,433,606, Cl. 89-1.812.

Allen, Billy R.: *See*—
Carrier, Robert C.; and Allen, Billy R., 4,433,977, Cl. 44-60.000.

Allen, Douglas, Jr.; and Flam, Eric, to C. R. Bard, Inc. Breathable ostomy gasket composition. 4,434,254, Cl. 523-105.000.

Allied Corporation: *See*—
Anderson, Philip M., III; Kearney, James E.; and Gordon, Scott E., 4,434,411, Cl. 335-208.000.
Smith, Robert W., 4,433,715, Cl. 164-423.000.

Allied Products Corporation: *See*—
Salmon, Joe E.; Strother, Fleetwood E.; and Crawford, James R., 4,433,454, Cl. 19-55.00R.

Allis-Chalmers Corporation: *See*—
Herwig, Warren E.; Kaminski, Tony L.; and Shupert, Paul T., 4,433,529, Cl. 56-10.200.

Aloisio, Charles J., Jr.; and Cammons, Ray R., to Bell Telephone Laboratories, Incorporated. Injection molded knockout. 4,434,120, Cl. 264-155.000.

Alsing, Carl J.: *See*—
Holland, Charles J.; Wallach, Steven; and Alsing, Carl J., 4,434,459, Cl. 364-200.000.

Altmansberger, David C.; Huss, Christina L.; and Kroger, Haans H., to General Electric Company. Removal of heavy metals content. 4,434,060, Cl. 210-724.000.

Alza Corporation: *See*—
Urquhart, John; and Theeuwes, Felix, 4,434,153, Cl. 424-22.000.

Amada Engineering & Service Co.: *See*—
Tsutsumi, Akira, 4,434,349, Cl. 219-121.0LG.

Amano, Katsuhisa; Kumagai, Tadashi; Masaki, Akio; Shimada, Shinichi; Suzuki, Takeshi; and Ohtaka, Shoichi, to Honda Giken Kogyo Kabushiki Kaisha. Secondary air introducing apparatus for internal combustion engine. 4,433,541, Cl. 60-293.000.

Amano, Matsuo; Teranishi, Takao; Mouri, Yasunori; Abe, Osamu; and Sasayama, Takao, to Hitachi, Ltd. System for controlling the starting operation of an internal combustion engine. 4,433,650, Cl. 123-179.00G.

Ambs, William J.: *See*—
Deeba, Michel; Ambs, William J.; and Cochran, Robert N., 4,434,300, Cl. 564-479.000.

American Cyanamid Company: *See*—
Longfield, James E., 4,434,275, Cl. 525-403.000.

American Hoechst Corporation: *See*—
Sanchez, Robert A., 4,434,293, Cl. 549-17.000.

American Laser Corporation: *See*—
Chaffee, Edwin G., 4,434,493, Cl. 372-86.000.

American Standard Inc.: *See*—
DeGraw, Kenneth J.; Wilcockson, Brian; Nickerson, Earl W.; Bocchini, William R.; Bogosian, Armen; and Proios, Steve, 4,433,443, Cl. 4-317.000.

American Systems Corporation: *See*—
Sommer, Robert C., 4,434,508, Cl. 455-306.000.

Ampex Corporation: *See*—
Crank, James D., 4,434,037, Cl. 204-192.00R.

Anderson, Gerry W.; and Stake, Dennis G., to GTI Corporation. Printing station for axial lead handling system. 4,433,622, Cl. 101-40.000.

Anderson, Philip M., III; Kearney, James E.; and Gordon, Scott E., to Allied Corporation. Temperature-sensitive switch. 4,434,411, Cl. 335-208.000.

Andoh, Tetsuji; Takagi, Shigeji; and Sakamoto, Takeshi, to Mitsubishi Denki Kabushiki Kaisha. Method for manufacturing a dynamoelectric machine. 4,433,472, Cl. 29-596.000.

Andrieux, Bernard, to Societe Anonyme dite: Delas-Weir. Heater unit for heating water to be supplied to a boiler and a water heater. 4,433,546, Cl. 60-691.000.

Anglin, Paul E.: *See*—
McGary, Charles W., Jr.; Pascarella, Vincent J.; Taller, Robert A.; Rhodes, Delmer R.; Anglin, Paul E.; and Daugherty, Charles W., 4,434,126, Cl. 264-303.000.

Anstey, Henry D.; Meiers, Gerald F.; and Koning, Richard W., to Deere & Company. Method for unplugging cylindrical baler. 4,433,619, Cl. 100-40.000.

Antindel, Gerald L.; and Picard, Robert J. Cable stripper. 4,433,484, Cl. 30-90.400.

Aoshika, Masayuki: *See*—
Tomizawa, Fumio; and Aoshika, Masayuki, 4,434,495, Cl. 373-76.000.

Apfelbeck, Otto L.; and Urish, Joseph M., to Westinghouse Electric Corp. Aircraft window heat controller with switched impedances. 4,434,358, Cl. 219-501.000.

Applied Technologies Associates: *See—*
Ott, Paul W.; Engebretson, Harold J.; LaHue, Philip M.; and Van Steenwyk, Brett H., 4,433,491, Cl. 33-302.000.

Arai, Yoshio: *See—*
Ohkubo, Tetsuo; Arai, Yoshio; and Kataoka, Hiroyuki, 4,434,431, Cl. 346-154.000.

Arakawa, Takeshi; and Ikeda, Hiroki, to Nippon Electric Co., Ltd. Memory system handling a plurality of bits as a unit to be processed. 4,434,502, Cl. 382-41.000.

Arato, Hiroshi: *See—*
Tanaka, Ichiro; Arato, Hiroshi; and Wakabayashi, Takaaki, 4,434,166, Cl. 424-250.000.

Arbed S. A. (Luxembourg): *See—*
Metz, Paul; Schleimer, Francois; Goedert, Ferdinand; Henrion, Romain; Klein, Henri; and Liesch, Jean-Francois, 4,434,005, Cl. 75-60.000.

ARBED, S.A.: *See—*
Liesch, Jean; Reiff, Nico; Reimen, Vlasta; Schmit, Romain; Schummer, Arthur; Simon, Jo; and Tonteling, Paul, 4,434,368, Cl. 250-339.000.

Archard, Thornton N. J.: *See—*
Erlam, David P.; and Archard, Thornton N. J., 4,433,788, Cl. 211-26.000.

Arditty, Herve: *See—*
Puech, Claude; Papuchon, Michel; and Arditty, Herve, 4,433,895, Cl. 350-96.130.

Arena-Ochoa, Guido. Nonsaturating electronic ballast for gas discharge tubes. 4,434,457, Cl. 363-133.000.

Arend, Gunter: *See—*
Linder, Wolfgang; Arend, Gunter; Barnikel, Carl-Dieter; and Frauenkron, Gunter, 4,434,070, Cl. 523-323.000.

Argabright, Perry A.; and Rhudy, John S., to Marathon Oil Company. Oil recovery process. 4,433,727, Cl. 166-252.000.

Arieh, Simon: *See—*
Coarvoisier, Guy; and Arieh, Simon, 4,433,494, Cl. 36-119.000.

Arlotte, Thomas F.: *See—*
Rollins, Kay; Key, Anthony N.; and Arlotte, Thomas F., 4,433,745, Cl. 180-118.000.

Armour Pharmaceutical Company: *See—*
Jones, John L.; and Rubino, Andrew M., 4,434,155, Cl. 424-47.000.

Armstrong World Industries, Inc.: *See—*
Lenox, Ronald S.; and Sparks, Moses, Jr., 4,434,007, Cl. 106-26.000.

Arneson Products, Inc.: *See—*
Selsted, Walter T., 4,434,050, Cl. 210-169.000.

Arons, Irving J.: *See—*
Sidman, Kenneth R.; and Arons, Irving J., 4,433,439, Cl. 2-161.00R.

Asahi Glass Company, Ltd.: *See—*
Kozawa, Shigeyuki; Hasegawa, Noboru; and Kawahara, Hiroshi, 4,434,277, Cl. 525-507.000.

Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Kurihara, Shigeru; and Ohashi, Hiroyuki, 4,434,029, Cl. 203-42.000.

Asano, Mitsuru: *See—*
Inoguchi, Kazuhiro; Nakanishi, Tomohiko; and Asano, Mitsuru, 4,434,117, Cl. 264-56.000.

Asayama, Yoshiaki, to Mitsubishi Denki Kabushiki Kaisha. Electronically controlled fuel injection device. 4,433,663, Cl. 123-494.000.

Ash, Gary S., to Optical Coating Laboratory, Inc. Article and method for forming thin film flakes and coatings. 4,434,010, Cl. 106-291.000.

Ashland Oil, Inc.: *See—*
Busch, Lloyd E.; Walters, Paul W.; and Zandona, Oliver J., 4,434,044, Cl. 208-91.000.
Ruazala, Ferdinand A., 4,434,298, Cl. 562-599.000.

Ashline, Clifford E. Automatic flotation release system. 4,433,638, Cl. 116-210.000.

Assut S.A.: *See—*
Bichon, Daniel, 4,433,688, Cl. 128-335.500.

Astrologes, Gary W., to Halocarbon Products Corporation. Process for the preparation of trifluoroethanol. 4,434,297, Cl. 560-236.000.

Atare, Zeltite A.: *See—*
Chipens, Gunar I.; Veretennikova, Nadezhda I.; and Atare, Zeltite A., 4,434,095, Cl. 260-112.50R.

Atkeisson, Randal A.: *See—*
Swartz, Harold L.; Atkeisson, Randal A.; Carter, Rodney A.; and Parker, Russell C., 4,434,391, Cl. 318-662.000.

Atkins, Ronald L.: *See—*
DeFusco, Albert A., Jr.; Nielsen, Arnold T.; and Atkins, Ronald L., 4,434,304, Cl. 568-710.000.

Atlantic Richfield Company: *See—*
Achorn, George S., 4,434,279, Cl. 526-66.000.
Chao, Tai S.; Smith, Aubrey C., Jr.; and Smies, Frederic D., 4,434,064, Cl. 252-29.000.
Miller, Richard F., 4,434,307, Cl. 585-4.000.
Withers, James C.; and Loutfy, Raouf O., 4,434,149, Cl. 423-496.000.

Audeh, Costandi A.; and Shihabi, David S., to Mobil Oil Corporation. Preventing phase separation of dewaxed oil. 4,434,046, Cl. 208-111.000.

Audi Nsu Auto Union Aktiengesellschaft: *See—*
Schaper, Siegfried, 4,434,121, Cl. 264-174.000.

Aylward, David E.: *See—*
Roling, Paul V.; Veazey, Richard L.; and Aylward, David E., 4,434,242, Cl. 502-107.000.

Azad, A. R. M.; Kirchanski, Stefan J.; and Brown, Michael C., to Ortho Diagnostic Systems, Inc. Immunological reagents employing polymeric backbone possessing reactive functional groups. 4,434,150, Cl. 424-1.100.

B.F. Goodrich Company, The: *See—*
Chasar, Dwight W., 4,434,265, Cl. 524-339.000.
Jablonski, Dane E., 4,434,274, Cl. 525-349.000.

B & W Engineering Corporation: *See—*
Brown, Jack M.; and Miller, Terrance S., 4,433,570, Cl. 73-12.000.

Baba, Kazuo, to Olympus Optical Co., Ltd. Ultrasonic diagnosis device. 4,433,692, Cl. 128-660.000.

Baba, Yasuharu; and Takeda, Masashi, to Sony Corporation. Oscillator having capacitor charging and discharging controlled by non-saturating switches. 4,434,408, Cl. 331-111.000.

Babcock & Wilcox Company, The: *See—*
Bohl, Thomas L.; Pocock, Robert E.; and Zimmerlin, Sharon L., 4,433,922, Cl. 374-36.000.
Zadiraka, Allan J., 4,433,646, Cl. 122-504.200.

Baboian, Robert; and Haynes, Gardner S., to Texas Instruments Incorporated. Corrosion protection system for hot water tanks. 4,434,039, Cl. 204-196.000.

Bach, Gerhard; Geiger, Friedhelm; Heimberger, Werner; Schreyer, Gerd; and Hillenbrand, Horst, to Degussa Aktiengesellschaft. Working up of the residual gases resulting from the production of cyanuric chloride. 4,434,148, Cl. 423-379.000.

Bacher, Walter; and Jacob, Eberhard, to Kernforschungszentrum Karlsruhe GmbH; and Maschinenfabrik Augsburg-Nurnberg AG. Method for removing adhering or dust-like deposits in systems handling uranium hexafluoride. 4,434,139, Cl. 423-19.000.

Badra, Sami A. Ankle protector. 4,433,682, Cl. 128-153.000.

Baggio, Giorgio, to Nordica S.p.A. Closure device particularly for ski boots. 4,433,456, Cl. 24-68.0SK.

Baile, Madhu, to Dow Corning Corporation. Heat curable polydiorganosiloxane compositions having enhanced release upon cure. 4,434,127, Cl. 264-236.000.

Bailey, Timothy F.; and Brunelle, Dennis S., to Combustion Engineering, Inc. Pin insertion tool. 4,433,476, Cl. 29-752.000.

Bairen, Donald J.; and Lucas, Thomas M. Collapsible sportsman's stool. 4,433,870, Cl. 297-16.000.

Baker, Clayton C., to Leslie Metal Arts Company. Lazy susan assembly having a rotational and vertical adjustment mechanism. 4,433,885, Cl. 312-305.000.

Baker International Corporation: *See—*
Baker, John R., 4,433,702, Cl. 137-527.600.
Bowyer, Michael L., 4,433,725, Cl. 166-65.00R.

Baker, John E.: *See—*
Vitols, Reinhards; Walkinshaw, Steven; Baker, John E.; Davies, Hywel R.; and Woodward, Adrian M., 4,433,561, Cl. 66-148.000.

Baker, John R., to Baker International Corporation. Fully opening flapper valve apparatus. 4,433,702, Cl. 137-527.600.

Baker, Lewin T.; Bose, Sanjay K.; and Huber, Paul G., to General Electric Company. Method for digital data transmission with bit-echoed arbitration. 4,434,421, Cl. 340-825.510.

Baker Oil Tools, Inc.: *See—*
Preston, Dan C., Jr.; and Kim, Yung J., 4,433,726, Cl. 166-118.000.
Weinberg, Roger A., 4,433,847, Cl. 277-125.000.

Balaban, Alvin R.: *See—*
Steckler, Steven A.; and Balaban, Alvin R., 4,434,439, Cl. 358-174.000.

Baldwin, Maynard M.; and Wyant, Robert E., to Battelle Development Corporation. Process for making symmetrical alkanediols and the bis-ethers thereof. 4,434,032, Cl. 204-72.000.

Ballentine, Howard K., Jr., to Paradyne Corporation. D.C. Power monitor. 4,434,378, Cl. 307-350.000.

Ballestrasse, Cindy L.; and Ruggeri, Robert T., to Electrochemical Technology Corp. Method of preparing acrylic ion-transfer membranes. 4,434,249, Cl. 521-27.000.

Ballmann, Hans J.: *See—*
von der Eltz, Hans-Ulrich; Heinisch, Peter; and Ballmann, Hans J., 4,433,976, Cl. 8-555.000.

Bally Manufacturing Corporation: *See—*
Hooker, Donald E.; and Tojza, Roman A., 4,433,844, Cl. 273-143.00R.

Bambach, Wolfgang: *See—*
Koeck, Klaus; Bambach, Wolfgang; Ruopp, Gerhard; and Mikley, Frank, 4,434,326, Cl. 179-2.0DP.

Ban, Jung J.: *See—*
Kim, Bill S.; and Ban, Jung J., 4,433,841, Cl. 273-338.000.

Banba, Toshiaki, to Toyo Aluminium Kabushiki Kaisha. Polymer-coated metallic pigments. 4,434,009, Cl. 106-290.000.

Bandag, Incorporated: *See—*
Brewer, Donaldee, 4,434,018, Cl. 156-96.000.

Barbano, Normand, to GTE Products Corporation. Multiple ring dipole array. 4,434,425, Cl. 343-797.000.

Barber, Arthur B. Roller shutter doors. 4,433,714, Cl. 160-235.000.

Barcza, Sandor, to Sandoz, Inc. Sulfur and silicon-containing fatty acid amides. 4,434,161, Cl. 424-184.000.

Barner, Robert P., Jr.; Bensadon, Joseph M.; Besseyre, Jacques A.; and Markey, Harold G., to International Business Machines Corporation. Self-switched data port in-band signaling protocol. 4,434,486, Cl. 370-110.100.

Barnette, Willie J., to Du Pont de Nemours, E. I., and Company. Separation of alkenes from alkadienes. 4,434,316, Cl. 585-833.000.

Barnikel, Carl-Dieter: *See—*
Linder, Wolfgang; Arend, Gunter; Barnikel, Carl-Dieter; and Frauenkron, Gunter, 4,434,070, Cl. 523-323.000.

Barton, Derek H. R.; and Motherwell, William B., to Roussel Uclaf. Dehydrogenation agents based on derivatives of selenium and their use in the dehydrogenation in the 1,4 positions of steroids. 4,434,080, Cl. 502-152.000.

BASF Aktiengesellschaft: *See*—
Hoelderich, Wolfgang; Mross, Wolf D.; and Schwarzmann, Matthias, 4,434,314, Cl. 585-640.000.

BASF Wyandotte Corporation: *See*—
Davis, Pauls; and Wilson, Joe C., 4,434,065, Cl. 252-75.000.
Kaneko, Thomas M., 4,434,077, Cl. 252-357.000.
Kaneko, Thomas M., 4,434,078, Cl. 252-357.000.

Bata Shoe Company: *See*—
Rys-Sikora, John, 4,434,253, Cl. 521-134.000.

Battelle Development Corporation: *See*—
Baldwin, Maynard M.; and Wyant, Robert E., 4,434,032, Cl. 204-72.000.

Battelle Memorial Institute: *See*—
Harmer, Alan L., 4,433,913, Cl. 356-133.000.

Bauman, William C.: *See*—
Lee, John M.; and Bauman, William C., 4,434,138, Cl. 423-7.000.

Baumann, Jurgen, to SIG Schweizerische Industrie-Gesellschaft. Gas piston operated automatic hand weapon. 4,433,611, Cl. 89-193.000.

Baumgartner, Richard, to Index-Werke Komm.-Ges. Hahn & Tessky. Device for setting the cutting edge of a tool fitted in a tool-holder externally of a machine tool, or for measuring the setting of said edge. 4,433,488, Cl. 33-185.00R.

Baumgen, Heinz: *See*—
Probst, Joachim; Kolb, Gunter; Mummenhoff, Peter; and Baumgen, Heinz, 4,434,269, Cl. 524-538.000.

Baxter Travenol Laboratories, Inc.: *See*—
Bischof, Reinhard, 4,433,974, Cl. 604-407.000.

Bayer Aktiengesellschaft: *See*—
Buysch, Hans-Josef; Krimm, Heinrich; and Rudolph, Hans, 4,434,105, Cl. 260-463.000.
Findeisen, Kurt; and Ziemann, Heinz, 4,434,289, Cl. 546-14.000.
Heinemann, Ulrich; Thomas, Rudolf; Lantzsch, Reinhard; Ditgens, Klaus; and Weber, Erhard, 4,434,292, Cl. 548-373.000.
Linder, Wolfgang; Arend, Gunter; Barnikel, Carl-Dieter; and Frauenkron, Gunter, 4,434,070, Cl. 523-323.000.
Probst, Joachim; Kolb, Gunter; Mummenhoff, Peter; and Baumgen, Heinz, 4,434,269, Cl. 524-538.000.
Sattlegger, Hans; Schnurrbusch, Karl; Degen, Bruno; and Achtenberg, Theo, 4,434,283, Cl. 528-34.000.

BBC Brown, Boveri & Company Limited: *See*—
Beriger, Conrad; Kucera, Ladislav; Schneider, Paul; and Spittaler, Gunther, 4,434,417, Cl. 338-53.000.

Beach, John. Stepladder stabilizer assembly. 4,433,754, Cl. 182-172.000.

Beard, Michael D.: *See*—
Edwards, Thomas M.; Kelley, James O.; and Beard, Michael D., 4,433,884, Cl. 312-256.000.

Beck, Alfred E.; and Cushing, Richard D., to Circle Machine Co., Inc. Rotary sprayers for applying uniform coats to conveyor supported work. 4,433,640, Cl. 118-323.000.

Beck, Heinz; Holtvoigt, Werner; and Mukerjee, Ambar, to Akzona, Inc. Thermoplastic resin shaping with olefin/maleimide copolymer lubricant. 4,434,260, Cl. 524-104.000.

Becka, Michael M.; and Bennett, George, to International Shoe Machine Corporation. Transferring successive workpieces to and from a work station. 4,433,632, Cl. 112-262.300.

Beckenhauer, Thomas. Method for retarding masonry efflorescence. 4,434,193, Cl. 427-299.000.

Becker, Otto, to W. Gunther GmbH. Mercury electrode switch. 4,434,337, Cl. 200-220.000.

Beckim, Kenneth A., to PPG Industries, Inc. Apparatus for and method of applying a pattern upon a substrate. 4,433,623, Cl. 101-123.000.

Beer, Robert W.: *See*—
Spiegelman, Stanley R.; Salton, Robert B.; Beer, Robert W.; Malandra, Louis J.; and Cognevich, Michael L., 4,433,828, Cl. 254-29.00A.

Beiersdorf Aktiengesellschaft: *See*—
Stenzel, Wolfgang, 4,434,167, Cl. 424-251.000.

Bell, Clifford J.; and Girgis, Ramsis S., to Westinghouse Electric Corp. Non-contaminating transformer oil pump, static arrester, and control circuit. 4,434,448, Cl. 361-23.000.

Bell, Lon E.; and Gruber, William P., to Technar, Inc. Snap-acting thermal relay. 4,434,414, Cl. 337-102.000.

Bell Telephone Laboratories, Incorporated: *See*—
Aloisio, Charles J., Jr.; and Cammons, Ray R., 4,434,120, Cl. 264-155.000.
Busch-Vishniac, Ilene J.; Wallace, Robert L., Jr.; and West, James E., 4,434,327, Cl. 179-111.00E.
Dickey, Larry W., 4,434,449, Cl. 361-124.000.
Gans, Michael J.; and Snell, William W., Jr., 4,434,405, Cl. 330-149.000.
Karga, James D.; and McCullough, Harold E., 4,433,477, Cl. 29-764.000.
Rolfe, Robert M., 4,434,497, Cl. 375-7.000.

Bellay, Jeffrey D.: *See*—
McDonough, Kevin C.; Hayn, John W.; and Bellay, Jeffrey D., 4,434,463, Cl. 364-200.000.

Ben Gurion University of the Negev Research and Development Authority: *See*—
Rabi, Tavassa; and Szekely, Eugen, 4,434,235, Cl. 436-110.000.

Benard, David J.; Pchelkin, Nicholas R.; McDermott, William E.; Ellis, David E.; and Miller, George W., to United States of America, Air Force. Method and apparatus for iodine vaporization. 4,434,492, Cl. 372-59.000.

Bendix Corporation, The: *See*—
Fairbairn, Leroy W.; and Waldron, Clifford R., 4,433,482, Cl. 29-882.000.
Ratchford, Lloyd G.; Werth, Dee A.; Luca, Vincent A., Jr.; and Schildkraut, Alan L., 4,433,889, Cl. 339-94.00M.
Thomas, Robert C.; Hornbuckle, John A.; and Fatka, Richard J., 4,434,470, Cl. 364-565.000.
Vick, Ralph L., 4,433,615, Cl. 91-420.000.

Benedetti, Carlo, to Piaggio & C. S.p.A. Process for manufacturing a flywheel magneto. 4,433,473, Cl. 29-598.000.

Bennett, George: *See*—
Becka, Michael M.; and Bennett, George, 4,433,632, Cl. 112-262.300.

Benoit, Harold P.; LaPasso, Leonard J.; and McBain, Ian, to Motion Control, Inc.; and Rockford Ball Screw Co. Anti-backlash nut assembly. 4,433,590, Cl. 74-409.000.

Bensadon, Joseph M.: *See*—
Barner, Robert P., Jr.; Bensadon, Joseph M.; Besseyre, Jacques A.; and Markey, Harold G., 4,434,486, Cl. 370-110.100.

Benson, Inc.: *See*—
Wegener, Mary J.; and Feinleib, Morris, 4,434,222, Cl. 430-135.000.

Berg, Robert H.; and Karuhn, Richard F., to Particle Data, Inc. Porous passage means and method for particle analyzing systems. 4,434,398, Cl. 324-71.400.

Bergl, Friedrich: *See*—
Blaas, Wolfgang; Bergl, Friedrich; and Wetmore, Judson D., 4,434,020, Cl. 156-216.000.

Berglund, Larry G.: *See*—
Rascati, Richard J.; and Berglund, Larry G., 4,433,923, Cl. 374-112.000.

Bergwerksverband GmbH: *See*—
Irresberger, Hermann, 4,433,945, Cl. 405-302.000.

Beriger, Conrad; Kucera, Ladislav; Schneider, Paul; and Spittaler, Gunther, to BBC Brown, Boveri & Company Limited. Liquid-cooled power resistor and use thereof. 4,434,417, Cl. 338-53.000.

Berkey Photo, Inc.: *See*—
Tarsia, Giuseppe, 4,433,907, Cl. 355-55.000.
Tarsia, Giuseppe, 4,433,910, Cl. 355-76.000.

Berlex Laboratories, Inc.: *See*—
Diamond, Julius; and Wohl, Ronald A., 4,434,174, Cl. 424-273.00B.

Bernabe, Vincent, Jr.: *See*—
Mentzer, William R.; and Bernabe, Vincent, Jr., 4,433,515, Cl. 52-115.000.

Berry, Robert L.: *See*—
Ko, Wen-Chuang; and Berry, Robert L., 4,433,471, Cl. 29-578.000.

Bert, Georges, to Thomson-CSF. Inverter using low-threshold-voltage field-effect transistors and a switching diode, formed as an integrated circuit. 4,434,379, Cl. 307-448.000.

Bertini, Millo. Target pigeon. 4,433,842, Cl. 273-363.000.

Bertrand, Rene. Machine for cutting curbstones, sidewalls and the like. 4,433,871, Cl. 299-41.000.

Besenval, Christian: *See*—
Melan, Giuseppe; Verdet, Pierre; and Besenval, Christian, 4,433,991, Cl. 65-1.000.

Besseyre, Jacques A.: *See*—
Barner, Robert P., Jr.; Bensadon, Joseph M.; Besseyre, Jacques A.; and Markey, Harold G., 4,434,486, Cl. 370-110.100.

Best, David W.; and Russell, Jeffrey D., to Rockwell International Corporation. Single pin time-sharing for serially inputting and outputting data from state machine register apparatus. 4,434,474, Cl. 364-900.000.

Betts, Dennis J., to International Computers Limited. Multilayer printed circuit boards. 4,434,321, Cl. 174-68.500.

Betts, Max W., to Courtaulds Limited. Presser foot for a knitting machine. 4,433,560, Cl. 66-64.000.

Bhattacharya, Somnath; Hu, Shih-Ming; Koopman, Nicholas G.; and Oldakowski, Chester C., to International Business Machines Corporation. Solder mound formation on substrates. 4,434,434, Cl. 357-71.000.

Biaggi, Armando, to Sulzer Brothers Limited. Spacer grid for supporting rod-shaped members. 4,433,721, Cl. 165-162.000.

BICC Public Limited Company: *See*—
Erlam, David P.; and Archard, Thornton N. J., 4,433,788, Cl. 211-26.000.

Bichon, Daniel, to Assut S.A. Method of coating a catgut suture. 4,433,688, Cl. 128-335.500.

Bickel, Hans: *See*—
Woodward, Robert B.; and Bickel, Hans, 4,434,287, Cl. 544-16.000.

Bickman, Bernard F., to Honeywell Inc. Moving torque coil oscillatory drive member. 4,433,691, Cl. 128-660.000.

Bienz, Hans, to Stoffel Seals Corporation. Hangtag with a link serving as a fastening device. 4,433,498, Cl. 40-2.00R.

Bighley, Alexandria D.: *See*—
Maravelas, William S., Jr.; Bighley, Alexandria D.; and Calabrese, Marco A., 4,433,880, Cl. 312-3.000.

Billington, Reginald; Edge, David J.; and Winterbotham, Peter, to Lever Brothers Company. Detergent compositions containing sulphosuccinates and high bloom gel strength protein. 4,434,088, Cl. 252-547.000.

Billington, Reginald; Edge, David J.; and Winterbotham, Peter, to Lever Brothers Company. Detergent compositions containing sulphosuccinates and undegraded protein. 4,434,089, Cl. 252-547.000.

Billington, Reginald: *See*—
Hampson, Jeffrey D.; and Billington, Reginald, 4,434,087, Cl. 252-545.000.
Hampson, Jeffrey D.; Billington, Reginald; and Cox, Ian R., 4,434,090, Cl. 252-547.000.

BioResearch Inc.: *See*—
Kurtz, Leonard D.; and LiCausi, Joseph M., 4,433,973, Cl. 604-403.000.

Bisagni, Emile; Ducrocq, Claire; Rivalle, Christian; Tambourin, Pierre; Wendling, Francoise; Civier, Alain; Montagnier, Luc; Chermann, Jean-Claude; Gruest, Jacqueline; and Lidereau, Rosette, to Agence Nationale de Valorisation de la Recherche. Pyrido (4,3-B) carbazoles substituted in the 1 position by a polyamine chain. 4,434,290, Cl. 546-70.000.

Bischof, Reinhard, to Baxter Travenol Laboratories, Inc. Mixing system for parenteral liquids. 4,433,974, Cl. 604-407.000.

Blaas, Wolfgang; Bergl, Friedrich; and Wetmore, Judson D., to Hold-A-Fold, Inc. Method of manufacture of waterbed liners. 4,434,020, Cl. 156-216.000.

Black, Charles E. Flexible surveyor's marker. 4,433,490, Cl. 33-293.000.

Black & Decker Inc.: *See*—
Chaconas, Peter C., 4,433,589, Cl. 74-325.000.

Blackwell, Jennings P., to Phillips Petroleum Company. Hydrolytic stability improving additive. 4,434,263, Cl. 524-322.000.

Blanchard, Andrew J.: *See*—
Correa, Aderbal C.; Gergely, John S.; and Blanchard, Andrew J., 4,434,364, Cl. 250-253.000.

Blandin, Yannick: *See*—
Debouzie, Alain; Sainte-Foi, Daniel; and Blandin, Yannick, 4,433,992, Cl. 65-3.100.

Blanton, William A.: *See*—
Dimpfl, William L.; and Blanton, William A., 4,434,147, Cl. 423-235.000.

Blaser, Richard F. Fueling system for internal combustion engine. 4,433,660, Cl. 123-266.000.

Blaul, Ronald L., to Trigent, Inc. High pressure parts washer. 4,433,698, Cl. 134-56.00R.

Blum, Walter: *See*—
Abt, Reinhold; Blum, Walter; and Bordovsky, Jaromir, 4,433,613, Cl. 91-358.00R.

Blyth, Geoffrey C., to Marconi Instruments Limited. Automatic test systems. 4,434,489, Cl. 371-29.000.

Bobechko, Kevin A. Self-adjusting spinal scoliosis fusion hook. 4,433,676, Cl. 128-69.000.

Bocchini, William R.: *See*—
DeGraw, Kenneth J.; Wilcockson, Brian; Nickerson, Earl W.; Bocchini, William R.; Bogossian, Armen; and Proios, Steve, 4,433,443, Cl. 4-317.000.

Boender, Carl H.; and Zigterman, Roger M., to Wallpapers Galore, Inc. Storage and display system for rolls of decorative wall covering. 4,433,883, Cl. 312-234.100.

Boggio, Giuseppe; and Lorenzi, Mario, to Ing. C. Olivetti & C., S.p.A. Reversal of connections of telegraphic line wires upon detection of unwanted polarity of the loop current. 4,434,324, Cl. 178-69.00R.

Bogossian, Armen: *See*—
DeGraw, Kenneth J.; Wilcockson, Brian; Nickerson, Earl W.; Bocchini, William R.; Bogossian, Armen; and Proios, Steve, 4,433,443, Cl. 4-317.000.

Bohl, Thomas L.; Pocock, Robert E.; and Zimmerlin, Sharon L., to Babcock & Wilcox Company, The. Calorimeter. 4,433,922, Cl. 374-36.000.

Bohman, Carl E., to Sperry Corporation. Metal detector apparatus. 4,433,528, Cl. 56-10.200.

Bohme, Rolf C.; and Lazerson, Max M., to General Mining Union Corporation Limited. Radiometric methods and means. 4,434,365, Cl. 250-255.000.

Bohnen, Klaus, to Hoffmann-La Roche Inc. Fungicidal compositions. 4,434,165, Cl. 424-248.400.

Bol, Izya, to Xerox Corporation. Method of making a self-aligned Schottky metal semi-conductor field effect transistor with buried source and drain. 4,434,013, Cl. 148-1.500.

Bolding, Charles N.; and Hastings, Paul D. Conduit bending and support device. 4,433,821, Cl. 248-65.000.

Bom, Cornelis J. G.: *See*—
van der Lely, Ary; and Bom, Cornelis J. G., 4,433,734, Cl. 172-68.000.

Bomgardner, Carl C.: *See*—
Mendel, Jack M.; Bomgardner, Carl C.; Rack, Robert W.; Scott, Donald G.; and Stritmater, August W., 4,433,917, Cl. 366-132.000.

Bonneau, Hilaire, to Pratt & Whitney Aircraft of Canada Limited. Sound suppressor liner. 4,433,751, Cl. 181-213.000.

Boon, Bart, to Gusto Engineering B.V. Method and apparatus for lowering and positioning a pipe line onto the bottom of a deep water. 4,433,938, Cl. 405-166.000.

Bor, Mubor es Cipoipari: *See*—
Keszei, Jeno; Varga, Laszlo; and Donath, Jeno, 4,433,485, Cl. 33-3.00R.

Bordovsky, Jaromir: *See*—
Abt, Reinhold; Blum, Walter; and Bordovsky, Jaromir, 4,433,613, Cl. 91-358.00R.

Borg-Warner Corporation: *See*—
Smirl, Richard L., 4,433,594, Cl. 74-689.000.

Borst, Williband, to Gebrueder Buehler AG. Pneumatic duct extraction. 4,433,986, Cl. 55-272.000.

Bosch & Pierburg System oHG: *See*—
Hartel, Gunter; Schurfeld, Armin; and Jordan, Wolfgang, 4,433,661, Cl. 123-339.000.

Bose, Ajit, to Leco Inc. Method and apparatus for cooling molten tube. 4,434,129, Cl. 264-557.000.

Bose, Sanjay K.: *See*—
Baker, Lewin T.; Bose, Sanjay K.; and Huber, Paul G., 4,434,421, Cl. 340-825.510.

Bott, John A. Vehicle article carrier. 4,433,804, Cl. 224-321.000.

Bouygues: *See*—
Richard, Pierre, 4,433,525, Cl. 52-741.000.

Bowen, Robert F.; and Martel, Thomas J., to Raytheon Company. Turntable for microwave oven. 4,434,343, Cl. 219-10.55F.

Bowyer, Michael L., to Baker International Corporation. Adjustable spacer with rotational lock. 4,433,725, Cl. 166-65.00R.

Boyce, William A., to Macaster Controls, Inc. Vehicle alignment apparatus and methods. 4,433,489, Cl. 33-203.180.

Bozec, Laurent: *See*—
Layotte, Pierre-Claude; and Bozec, Laurent, 4,433,736, Cl. 173-94.000.

Brader, Walter H., Jr.: *See*—
Larkin, John M.; and Brader, Walter H., Jr., 4,434,309, Cl. 585-10.000.

Brady, Welby D., to Temp-Control Corporation. Pipe freezing device. 4,433,556, Cl. 62-293.000.

Brake, Bobby G.: *See*—
Chatterji, Jiten; Brake, Bobby G.; and Tinsley, John M., 4,433,731, Cl. 166-293.000.

Brandenstein, Manfred; Hans, Ruiger; Horling, Peter; Hetterich, Hermann; Pape, Gebhard; and Gossmann, Willi, to SKF Kugellagerfabriken GmbH. Roller bearings installed without clearance and preloaded. 4,433,932, Cl. 403-261.000.

Brandenstein, Manfred: *See*—
Olschewski, Armin; Brandenstein, Manfred; Walter, Lothar; and Kunkel, Heinrich, 4,433,768, Cl. 192-98.000.
Walter, Lothar; Brandenstein, Manfred; Ernst, Horst M.; and Olschewski, Armin, 4,433,875, Cl. 308-6.00R.

Brandhurst Company Limited: *See*—
Williams, Anthony P.; and Carter, Ralph G., 4,433,574, Cl. 73-200.000.

Brasseur, Georg, to Friedmann & Maier Aktiengesellschaft. Circuit arrangement for controlling the commutation in a stepping motor. 4,434,392, Cl. 318-696.000.

Breed, Dirk J.: *See*—
Robertson, John M.; Breed, Dirk J.; and Voermans, Antonius B., 4,434,212, Cl. 428-693.000.

Breedis, John F.: *See*—
Saleh, Yousef; Breedis, John F.; and Crane, Jacob, 4,434,016, Cl. 148-12.70C.

Brendlinger, Edward C., to United States Steel Corporation. Vertical-pass electrotreating cell. 4,434,040, Cl. 204-206.000.

Bresin, Elias H., to Bresin, Elias H.; and Sanders, David, a part interest. Thermostatically-regulated arrangement for and method of switching power to a heating/cooling system, and methods of installing and retrofitting the arrangement at an electrical outlet box. 4,433,718, Cl. 165-12.000.

Brewer, Donaldee, to Bandag, Incorporated. Tire retreading system with envelope pressure. 4,434,018, Cl. 156-96.000.

Bricco, Larry J., to Laminations Corporation. Multi-ply paper target. 4,433,843, Cl. 273-407.000.

Briefer, Dennis K., to Setra Systems, Inc. Diaphragm. 4,434,203, Cl. 428-152.000.

British Hovercraft Corporation Ltd.: *See*—
Rollins, Kay; Key, Anthony N.; and Arlotte, Thomas F., 4,433,745, Cl. 180-118.000.

Brooks, Kenneth E., Jr. Fragrance or the like dispenser, particularly for automobiles. 4,433,796, Cl. 222-135.000.

Brooks, Ralf M.: *See*—
Osmera, Miroslav S.; Brooks, Ralf M.; and Kim, Sung-Soon, 4,433,902, Cl. 354-10.000.

Bross, Roger B.: *See*—
Langley, Lawrence W.; and Bross, Roger B., 4,434,389, Cl. 318-254.000.

Brouwer, Peter: *See*—
Desia, Nitin; Delaney, Rory A. M.; Brouwer, Peter; and Huang, Victor T., 4,434,186, Cl. 426-565.000.

Brown, Bobby L., to Mar-Kay Plastics, Inc. Blow molded dynamite tube. 4,433,625, Cl. 102-331.000.

Brown Boveri Electric, Inc.: *See*—
Garzon, Ruben D., 4,434,336, Cl. 200-150.00G.

Brown, George L. Modular, stackable, suspendable drawer cabinet. 4,433,882, Cl. 312-111.000.

Brown, Jack M.; and Miller, Terrance S., to B & W Engineering Corporation. Mechanical shock machine. 4,433,570, Cl. 73-12.000.

Brown, Michael C.: *See*—
Azad, A. R. M.; Kirchanski, Stefan J.; and Brown, Michael C., 4,434,150, Cl. 424-1.100.

Brown, William H. Application for spraying liquid chemical onto drill pipe. 4,433,639, Cl. 118-316.000.

Brugel, Edward G.; and Yllo, Walter, to Du Pont de Nemours, E. I., and Company. Extrudable self-supporting hot melt adhesive sheet. 4,434,261, Cl. 524-109.000.

Bruker-Franzen Analytik GmbH: *See*—
Odernheimer, Bernhard; Kremer, Johannes H.; and Kranich, Klaus O., 4,433,982, Cl. 55-158.000.

Brunelle, Dennis S.: *See*—
Bailey, Timothy F.; and Brunelle, Dennis S., 4,433,476, Cl. 29-752.000.

Brunswick Corporation: *See*—
Fitzner, Arthur O., 4,433,668, Cl. 123-597.000.

Bucher, Bernard: *See*—
Dostert, Philippe; Imbert, Thierry; and Bucher, Bernard, 4,434,170, Cl. 424-265.000.
Buckley, Alan; Conciatori, Anthony B.; and Calundann, Gordon W., to Celanese Corporation. Melt processable blend of a low molecular weight liquid crystalline compound and a polyolefin or polyester. 4,434,262, Cl. 524-237.000.
Buirley, William L.; Koopman, Donald E.; McQuain, David B.; and Reeves, William H., to Vectra International Corporation. Microencapsulated cholesteric liquid crystal temperature measuring device for determining the temperature of non-planar or planar surfaces. 4,433,637, Cl. 116-207.000.
Bujalski, Joseph, to Motorola, Inc. Interline spacing adjustment circuit in a scanning CRT visual display system. 4,434,420, Cl. 340-724.000.
Buljan, Sergej-Tomislav: *See*—
Sarin, Vinod K.; Penty, Robert A.; and Buljan, Sergej-Tomislav, 4,433,979, Cl. 51-307.000.
Bunger, Richard E. Fence tensioning device. 4,433,831, Cl. 256-39.000.
Buracchi, Livio: *See*—
Giobbio, Vincenzo; Ornato, Giorgio; Buracchi, Livio; and Mangia, Alberto, 4,434,097, Cl. 260-112.50R.
Burgio, Antonio, to Fiat Auto S.p.A. Precombustion chamber for internal combustion engines with compression-ignition. 4,433,659, Cl. 123-256.000.
Burhans, Allison S.; and Spurr, Orson K., Jr., to Union Carbide Corporation. Curable epoxy resin containing compositions. 4,434,286, Cl. 528-297.000.
Burke, Roger M.; DeSatnick, Allen H.; and Honkanen, George P., to Acufex Microsurgical, Inc. Microsurgical scissors. 4,433,687, Cl. 128-318.000.
Burlingame, Glen E.: *See*—
Cook, Steven F.; and Burlingame, Glen E., 4,433,787, Cl. 211-5.000.
Burlington Industries, Inc.: *See*—
Fash, William G.; and Davis, Delbert A., 4,434,200, Cl. 428-257.000.
Burroughs Corporation: *See*—
Chang, Gerald W., 4,434,403, Cl. 328-120.000.
Busby, Dennis L. Selective, locally defined heating of a body. 4,434,341, Cl. 219-10.55A.
Busch, Lloyd E.; Walters, Paul W.; and Zandona, Oliver J., to Ashland Oil, Inc. Method for recovering sulfur oxides from CO-rich flue gas. 4,434,044, Cl. 208-91.000.
Busch-Vishniac, Ilene J.; Wallace, Robert L., Jr.; and West, James E., to Bell Telephone Laboratories, Incorporated. Electret transducer with variable actual air gap. 4,434,327, Cl. 179-111.00E.
Buss, Waldeen C.; and Hughes, Thomas R., to Chevron Research Company. Conversion of alkycyclopentanes to aromatics. 4,434,311, Cl. 585-444.000.
Butler, Donald E.: *See*—
Poschel, Bruno P. H.; and Butler, Donald E., 4,434,169, Cl. 424-263.000.
Butts, Douglas E., to Inland Enterprises, Inc. Metallurgical lance. 4,433,832, Cl. 266-87.000.
Buysch, Hans-Josef; Krimm, Heinrich; and Rudolph, Hans, to Bayer Aktiengesellschaft. Process for the preparation of dialkyl carbonates. 4,434,105, Cl. 260-463.000.
Byrd, Franklin D. Can top lid holder. 4,433,864, Cl. 294-27.00H.
Byrne, Edmund F.; and Tolman, Glen L., to Medi-Physics, Inc. Bifunctional chelating agents. 4,434,151, Cl. 424-1.100.
Byrns, John P.: *See*—
Levine, Stephen N.; Dabbish, Ezzat A.; and Byrns, John P., 4,434,323, Cl. 178-22.170.
Bzdula, Joseph A., to Carrier Corporation. Method of testing oil for ionic contaminants. 4,434,233, Cl. 436-60.000.
C. R. Bard, Inc.: *See*—
Allen, Douglas, Jr.; and Flam, Eric, 4,434,254, Cl. 523-105.000.
C. Van der Lely N.V.: *See*—
van der Lely, Ary; and Bom, Cornelis J. G., 4,433,734, Cl. 172-68.000.
Caddick, Gary R.; and Guest, Philip Q., Jr., to International Telephone and Telegraph Corporation. Automatic position control for a vehicle seat. 4,434,468, Cl. 364-424.000.
Caggiano, Nurmi. Paint can receptacle and the like. 4,433,822, Cl. 248-210.000.
Calabrese, Marco A.: *See*—
Maravelas, William S., Jr.; Bighley, Alexandria D.; and Calabrese, Marco A., 4,433,880, Cl. 312-3.000.
Calkins, George B.: *See*—
Sarnoff, Stanley J.; Malooley, Rudolph S.; Calkins, George B.; and Tarello, William R., 4,433,684, Cl. 128-203.210.
Callerame, Joseph: *See*—
Dunnrowicz, Clarence J.; and Callerame, Joseph, 4,434,384, Cl. 310-325.000.
Callihan, Clayton D., to Louisiana State University Board of Supervisors. Process for the refrigeration of an enclosure. 4,433,553, Cl. 62-94.000.
Calmar, Inc.: *See*—
Corsette, Douglas F., 4,433,799, Cl. 222-309.000.
Calundann, Gordon W.: *See*—
Buckley, Alan; Conciatori, Anthony B.; and Calundann, Gordon W., 4,434,262, Cl. 524-237.000.
Cammons, Ray R.: *See*—
Aloisio, Charles J., Jr.; and Cammons, Ray R., 4,434,120, Cl. 264-155.000.
Campbell, Ira J., to Westinghouse Electric Corp. Lifting system for a turbine disc. 4,433,830, Cl. 254-264.000.
Campbell, James. Glare-eliminating task lighting fixture. 4,434,453, Cl. 362-33.000.
Canon Denshi Kabushiki Kaisha: *See*—
Toshmitsu, Naohiko, 4,434,446, Cl. 360-125.000.
Canon Kabushiki Kaisha: *See*—
Nakata, Shinichi, 4,434,354, Cl. 219-216.000.
Omi, Kokichi; and Kuroda, Yasuo, 4,433,908, Cl. 355-68.000.
Sekimura, Nobuyuki, 4,433,900, Cl. 350-331.00R.
Sumino, Fumio, 4,434,219, Cl. 430-96.000.
Toshmitsu, Naohiko, 4,434,446, Cl. 360-125.000.
Caputo, William R.; and Husson, Alan L., to Westinghouse Electric Corp. Elevator system. 4,433,756, Cl. 187-29.00R.
Caray, Andre, to Valeo S.A. Torsion damping device for a clutch plate. 4,433,771, Cl. 192-106.200.
Carl Freudenberg, Firma: *See*—
Hartman, Ludwig; Ruzek, Ivo; and Locher, Engelbert, 4,434,204, Cl. 428-198.000.
Carletta, Giuseppe, to Murtas, Eugenio. Automobile window regulator. 4,433,508, Cl. 49-348.000.
Carlson, Gustaf B.: *See*—
Mellon, Timothy; and Carlson, Gustaf B., 4,433,712, Cl. 160-122.000.
Carmillet, Roger: *See*—
Loizeau, Pierre; and Carmillet, Roger, 4,433,770, Cl. 192-106.200.
Carrier Corporation: *See*—
Bzdula, Joseph A., 4,434,233, Cl. 436-60.000.
Carrier, Robert C.; and Allen, Billy R., to Texaco Inc. Situ process for making multifunctional fuel additives. 4,433,977, Cl. 44-60.000.
Carrington, Alfred C. Aerodynamic device. 4,433,819, Cl. 244-12.200.
Carstensen, Walter H.: *See*—
Edwards, Ralston G., Jr.; Walkden, John R. B.; Carstensen, Walter H.; Murphy, Gregory E.; and Lisi, John E., 4,433,776, Cl. 198-779.000.
Carter, Ralph G.: *See*—
Williams, Anthony P.; and Carter, Ralph G., 4,433,574, Cl. 73-200.000.
Carter, Rodney A.: *See*—
Swartz, Harold L.; Atkeisson, Randal A.; Carter, Rodney A.; and Parker, Russell C., 4,434,391, Cl. 318-662.000.
Carver, LeRoy J.; and Penrod, John K. Electrical lighting controller. 4,434,388, Cl. 315-307.000.
Cassarly, James W.; Rollings, Robert W.; and Youngfleish, Frank C., to Elco Corporation. Connector mounting for integrated circuit chip packages. 4,433,886, Cl. 339-14.00R.
Caudy, Don W.; Hackman, Donald J.; Myers, John R.; and Hoffman, Robert T., to United States of America, Navy. Controlled gas generator system. 4,433,633, Cl. 114-54.000.
Cavallari, Pier G., to Honeywell Information Systems Italia. Electromagnet assembly for mosaic printing head and related manufacturing method. 4,433,927, Cl. 400-124.000.
Cech, Miloslav; Kuda, Vladimir; and Vasicek, Vladimir, to Vyzkumny a vyvojovy ustav Zavodu vseobecneho strojirenstvi. Picking channel for a jet loom. 4,433,705, Cl. 139-435.000.
Celanese Corporation: *See*—
Buckley, Alan; Conciatori, Anthony B.; and Calundann, Gordon W., 4,434,262, Cl. 524-237.000.
Skiscim, Ronald J., 4,434,278, Cl. 525-531.000.
Cellu-Craft Inc.: *See*—
McDowell, Curtis S., 4,434,061, Cl. 210-787.000.
Centrifugal Piston Expander, Inc.: *See*—
Dibrell, Edwin W., 4,433,551, Cl. 62-87.000.
Chaconas, Peter C., to Black & Decker Inc. Gear reduction arrangement for variable speed power driven tool. 4,433,589, Cl. 74-325.000.
Chaffee, Edwin G., to American Laser Corporation. Argon-ion gas laser cathode construction. 4,434,493, Cl. 372-86.000.
Challenger Caribbean Corporation: *See*—
Gregory, George D., 4,433,891, Cl. 339-217.00R.
Challenger Products Corporation: *See*—
Gregory, George D., 4,433,891, Cl. 339-217.00R.
Chalmers, Edward L., II; and Everest, David C., III, to Lange International S.A. Buckle, notably for ski boots. 4,433,457, Cl. 24-68.0SK.
Champion International Corporation: *See*—
Koll, Eugene A., 4,433,968, Cl. 425-392.000.
Champion Spark Plug Company: *See*—
Grime, Thomas E., 4,433,812, Cl. 239-290.000.
Chance, James O., Jr.: *See*—
Lavender, Gerry R.; and Chance, James O., Jr., 4,434,125, Cl. 264-262.000.
Chandler, Eugene J. Human knee model suitable for teaching operative arthroscopy and having replaceable joint. 4,433,961, Cl. 434-274.000.
Chandler, William S.; Wilkens, Walter F.; and Heiss, John F., to Diamond Crystal Salt Company. Meat curing composition. 4,434,187, Cl. 426-652.000.
Chang, Clarence D.; and Lang, William H., to Mobil Oil Corporation. Production of aromatic amines using crystalline silicate catalysts. 4,434,299, Cl. 564-396.000.
Chang, Gerald W., to Burroughs Corporation. Universal reset circuit for digital circuitry. 4,434,403, Cl. 328-120.000.
Chang, Michael N.: *See*—
Doherty, James B.; Chang, Michael N.; and Dorn, Conrad P., 4,434,175, Cl. 424-274.000.
Chang, Yan P. Thermal power plants and heat exchangers for use therewith. 4,433,545, Cl. 60-678.000.
Chao, Tai S.; Smith, Aubrey C., Jr.; and Smies, Frederic D., to Atlantic Richfield Company. Graphite dispersion. 4,434,064, Cl. 252-29.000.

Chapman, David D.: *See*—
Palmquist, Steven R.; Chapman, David D.; and Hoeren, Gerd H., 4,434,488, Cl. 371-15.000.

Charnley, John, to Charnley Surgical Inventions Limited. Trimming aid. 4,433,686, Cl. 128-303.00R.

Charnley Surgical Inventions Limited: *See*—
Charnley, John, 4,433,686, Cl. 128-303.00R.

Charon, Clarence W.; and Reid, Kenneth E., to Owens-Corning Fiberglas Corporation. Method of utilizing glass fibers in composite gasket structures. 4,434,255, Cl. 523-209.000.

Chasar, Dwight W., to B.F. Goodrich Company, The. Metacyclophane, synthesis thereof, and compositions stabilized thereby. 4,434,265, Cl. 524-339.000.

Chatterji, Jiten; Brake, Bobby G.; and Tinsley, John M., to Halliburton Company. Liquid water loss reducing additives for cement slurries. 4,433,731, Cl. 166-293.000.

Chattopadhayay, Asoke: *See*—
Muller, Hans-Jurgen; Schmidt, Karl; Chattopadhayay, Asoke; Heidemanns, Rolf P.; Habel, Georg; and Wittman, Ortwin, 4,433,662, Cl. 123-438.000.

Chemische Werke Huels Aktiengesellschaft: *See*—
Horlbeck, Gernot; and Heuer, Horst, 4,434,276, Cl. 525-437.000.
Kampf, Wolfgang, 4,434,310, Cl. 585-377.000.

Chen, Timothy S.: *See*—
Rosser, Robert W.; Chen, Timothy S.; and Cheng, Chung-Heng, 4,434,106, Cl. 260-465.50R.

Chen, Yung J.; and Mei, Eden Y. C., to McDonnell Douglas Corporation. Nonvolatile memory sensing system. 4,434,479, Cl. 365-210.000.

Cheng, Chen-Yen; and Cheng, Sing-Wang. Parallel contact distillative freezing process for separating volatile mixtures and apparatuses for use therein. 4,433,558, Cl. 62-537.000.

Cheng, Chung-Heng: *See*—
Rosser, Robert W.; Chen, Timothy S.; and Cheng, Chung-Heng, 4,434,106, Cl. 260-465.50R.

Cheng, Sing-Wang: *See*—
Cheng, Chen-Yen; and Cheng, Sing-Wang, 4,433,558, Cl. 62-537.000.

Chermann, Jean-Claude: *See*—
Bisagni, Emile; Ducrocq, Claire; Rivalle, Christian; Tambourin, Pierre; Wendling, Francoise; Civier, Alain; Montagnier, Luc; Chermann, Jean-Claude; Gruest, Jacqueline; and Lidereau, Rosette, 4,434,290, Cl. 546-70.000.

Cheron, Jacques: *See*—
Rojey, Alexandre; and Cheron, Jacques, 4,433,554, Cl. 62-112.000.

Cherry, Raymond L.; Pfeiffer, Gene F.; and Maes, Randell P., to TASA Products Limited. Portable, remote environmental control system. 4,433,719, Cl. 165-26.000.

Chevron Research Company: *See*—
Buss, Waldeen C.; and Hughes, Thomas R., 4,434,311, Cl. 585-444.000.
Dimpfl, William L.; and Blanton, William A., 4,434,147, Cl. 423-235.000.
Farnham, Robert A., 4,433,707, Cl. 141-1.000.
Hubred, Gale L.; and Van Leirsburg, Dean A., 4,434,140, Cl. 423-54.000.
Hubred, Gale L.; and Van Leirsburg, Dean A., 4,434,141, Cl. 423-54.000.
Streib, Stephen F., 4,434,418, Cl. 340-606.000.
Thomas, Elmer L., 4,434,507, Cl. 455-95.000.

Chibata, Ichiro; Yamada, Shigeki; Hongo, Chikara; and Yoshioka, Ryuzo, to Tanabe Seiyaku Co., Ltd. Process for preparing an optically active p-hydroxyphenylglycine or a salt thereof. 4,434,107, Cl. 260-501.120.

Chicago Rawhide Manufacturing Company: *See*—
Romero, Richard A.; and Schmidt, Michael J., 4,433,846, Cl. 277-9.000.

Chick, Douglas K., to Insituform International, Inc. Method for remote lining of side connections. 4,434,115, Cl. 264-36.000.

Chikarainhi, Takayo, to Nissan Motor Company, Limited. Structure for preventing vertical movement of a sliding door. 4,433,507, Cl. 49-213.000.

CHINOIN Gyogyszer es Vegyeszeti Termekek Gyara Rt.: *See*—
Horvath, Tibor; Udvardy, Agnes; David, Agoston; and Marmarosi nee Kellner, Katalin, 4,434,152, Cl. 424-19.000.

Chipens, Gunar I.; Veretennikova, Nadezhda I.; and Atare, Zeltite A., to Institute Organicheskogo Sinteza. Cyclic analogue of naturally-occurring phagocytosis-stimulant peptide - threonyl-cyclo-[-N$^{\varepsilon}$-lysyl-prolyl-arginyl]. 4,434,095, Cl. 260-112.50R.

Cho, Frederick Y.; and Williams, Dylan F., to Motorola Inc. Temperature stable surface acoustic wave device. 4,434,383, Cl. 310-313.00R.

Christ, Richard; and Kroll, Hartmut. Neutron shielding. 4,434,373, Cl. 250-506.100.

Christianson, Roy O.; and Christianson, Ted T., to Christianson Systems, Inc. Discharge system for grain handling apparatus. 4,433,946, Cl. 406-43.000.

Christianson Systems, Inc.: *See*—
Christianson, Roy O.; and Christianson, Ted T., 4,433,946, Cl. 406-43.000.

Christianson, Ted T.: *See*—
Christianson, Roy O.; and Christianson, Ted T., 4,433,946, Cl. 406-43.000.

Chuba Electric Power Company Inc., The: *See*—
Gomi, Yoshiaki; Hirata, Takahiro; Takaoka, Michio; Mohtai, Tsuneaki; and Akashi, Kazuya, 4,434,319, Cl. 174-13.000.

Ciba-Geigy Corporation: *See*—
Gschwend, Heinz W., 4,434,100, Cl. 260-330.300.
Maier, Ludwig, 4,434,108, Cl. 260-951.000.
Meyer, Hans R., 4,433,975, Cl. 8-648.000.
Rasberger, Michael, 4,434,109, Cl. 260-958.000.
Rempfler, Hermann; and Fory, Werner, 4,433,998, Cl. 71-94.000.
Woodward, Robert B.; and Bickel, Hans, 4,434,287, Cl. 544-16.000.

Cii/Honeywell Bull (Societe Anonyme): *See*—
Michel, Ugon; and Herve, Robert, 4,434,473, Cl. 364-900.000.

Circle Machine Co., Inc.: *See*—
Beck, Alfred E.; and Cushing, Richard D., 4,433,640, Cl. 118-323.000.

Cities Service Co.: *See*—
Roling, Paul V.; Veazey, Richard L.; and Aylward, David E., 4,434,242, Cl. 502-107.000.

Citizen Watch Company Limited: *See*—
Nishimura, Katsuo; and Sekiya, Fukuo, 4,433,918, Cl. 368-74.000.
Sekiya, Fukuo; Morokawa, Shigeru; and Iwakura, Ryoji, 4,433,920, Cl. 368-201.000.

Civier, Alain: *See*—
Bisagni, Emile; Ducrocq, Claire; Rivalle, Christian; Tambourin, Pierre; Wendling, Francoise; Civier, Alain; Montagnier, Luc; Chermann, Jean-Claude; Gruest, Jacqueline; and Lidereau, Rosette, 4,434,290, Cl. 546-70.000.

Clarion Co., Ltd.: *See*—
Watanabe, Tadaaki; and Tanaka, Yoshio, 4,433,588, Cl. 74-10.330.

Clark, Leslie, to Roneo Alcatel Limited. Duplicating stencil. 4,434,198, Cl. 428-43.000.

Clark, Otho A. Sprayer trailer, tillage implement and hitch for attaching implement to trailer. 4,433,735, Cl. 172-443.000.

Clarke, Frederick; Lorenzi, Donald E.; and Schaefer, Edward F., to Magnaflux Corporation. Atmosphere control for photographic pipeline inspection. 4,434,427, Cl. 346-33.00P.

Cleland, Marshall, to Radiation Dynamics, Inc. Method and apparatus for wide angle beam scanning to internally irradiate hollow objects. 4,434,372, Cl. 250-400.000.

Cleveland, Donald C., to Rockwell International Corporation. Push-pull yoke-power takeoff coupling. 4,433,934, Cl. 403-318.000.

Cline, Warren K.; and Owens, William F., to Olin Corporation. Wrapper for smoking articles and method. 4,433,697, Cl. 131-365.000.

Coast, John B., to Coast Machinery, Inc. Tracked, amphibious vehicle with track securement and guide means. 4,433,634, Cl. 114-270.000.

Coast Machinery, Inc.: *See*—
Coast, John B., 4,433,634, Cl. 114-270.000.

Cochran, Robert N.: *See*—
Deeba, Michel; Ambs, William J.; and Cochran, Robert N., 4,434,300, Cl. 564-479.000.

Coffel, Jerome F., to Honeywell Inc. Beacon-receiver for command guided missiles. 4,433,818, Cl. 244-3.130.

Cognevich, Michael L.: *See*—
Spiegelman, Stanley R.; Salton, Robert B.; Beer, Robert W.; Malandra, Louis J.; and Cognevich, Michael L., 4,433,828, Cl. 254-29.00A.

Cohen, I. Kelman. Prosthesis formed by inner and outer inflatable containers. 4,433,440, Cl. 3-36.000.

Cohen, Noal; and Weber, Giuseppe, to Hoffmann-La Roche Inc. Inhibitors of SRS-synthesis. 4,434,101, Cl. 260-410.90R.

Colanzi, Franco, to RIV-SKF Officine Di Villar Perosa SpA. Support assembly for vehicle wheels. 4,433,877, Cl. 308-191.000.

Coleman, Charles R.: *See*—
Rukavina, Thomas G.; and Coleman, Charles R., 4,434,284, Cl. 528-58.000.

Coleman, Patrick L.; and Wehrly, John A., to Du Pont de Nemours, E. I., and Company. Substrates for the quantitative determination of proteolytic enzymes. 4,434,096, Cl. 260-112.50R.

Collagen Corporation: *See*—
Seyedin, Saeid; and Thomas, Thomas, 4,434,094, Cl. 260-112.00R.

Colombo, Edilberto, to Agip Petroli S.p.A. Multifunctional additives for lubricants. 4,434,291, Cl. 548-116.000.

Colt Industries Operating Corp: *See*—
Tatro, Henry J., 4,433,610, Cl. 89-148.000.

Coltene AG: *See*—
Schmid, Alfred, Jr.; Muller, Hans; and Jaecklin, Alexander P., 4,433,779, Cl. 206-220.000.

Comalco Limited: *See*—
Smith, David M., 4,434,014, Cl. 148-3.000.

Combustion Engineering, Inc.: *See*—
Bailey, Timothy F.; and Brunelle, Dennis S., 4,433,476, Cl. 29-752.000.

Commander Electrical Equipment, Inc.: *See*—
Gregory, George D., 4,433,891, Cl. 339-217.00R.

Compagnie Generale de Geophysique: *See*—
Layotte, Pierre-Claude; and Bozec, Laurent, 4,433,736, Cl. 173-94.000.

Comparetto, John E. Bone elongation or shortening method. 4,433,681, Cl. 128-92.00E.

Conciatori, Anthony B.: *See*—
Buckley, Alan; Conciatori, Anthony B.; and Calundann, Gordon W., 4,434,262, Cl. 524-237.000.

Conoco Inc.: *See*—
Correa, Aderbal C.; Gergely, John S.; and Blanchard, Andrew J., 4,434,364, Cl. 250-253.000.
Joosten, Michael W., 4,433,582, Cl. 73-788.000.

Consolidated Papers, Inc.: *See*—
Gebert, Kenneth W.; and Rajski, Pat A., 4,434,194, Cl. 427-356.000.

Conwed Corporation: *See*—
Fair, Timothy K., Sr., 4,434,199, Cl. 428-134.000.

Cook, Bruce M., to Westinghouse Electric Corp. Power supply with nuclear reactor. 4,434,132, Cl. 376-259.000.

Cook, Herbert C.; and Troutman, Ronald R., to International Business Machines Corporation. Programming floating gate devices. 4,434,478, Cl. 365-185.000.

Cook, Lee M.; Mader, Karl-Heinz; and Schnabel, Roland, to Schott Glass Technologies, Inc. Integral anti-reflective surfaces of silicate glasses. 4,434,191, Cl. 427-165.000.

Cook, Steven F.; and Burlingame, Glen E. Coin operated bicycle locking rack. 4,433,787, Cl. 211-5.000.

Cook Stolowitz & Frame: *See*—
Harrison, David B., 4,433,940, Cl. 405-210.000.

Cookerly, Jack C.: *See*—
Hall, George R.; Hall, Robert J.; and Cookerly, Jack C., 4,433,601, Cl. 84-1.030.

Coons, Robert R.: *See*—
Prokop, Josef F.; Coons, Robert R.; and Mylander, Richard H., 4,433,762, Cl. 192-4.00A.

Corah Limited: *See*—
Vitols, Reinhards; Walkinshaw, Steven; Baker, John E.; Davies, Hywel R.; and Woodward, Adrian M., 4,433,561, Cl. 66-148.000.

Cornelius, Walter; Kosek, Thomas P.; and Klomp, Edward D., to General Motors Corporation. Low emission combustor. 4,433,540, Cl. 60-39.511.

Cornell Research Foundation: *See*—
Meister, Alton; and Williamson, Joanne M., 4,434,158, Cl. 424-94.000.

Correa, Aderbal C.; Gergely, John S.; and Blanchard, Andrew J., to Conoco Inc. Method and apparatus for underwater detection of hydrocarbons. 4,434,364, Cl. 250-253.000.

Corsette, Douglas F., to Calmar, Inc. Liquid dispensing pump arrangement with selective stroke restriction. 4,433,799, Cl. 222-309.000.

Cosenza, Frank J., to Rexnord Inc. Stud assembly for thin walled panels. 4,433,930, Cl. 403-12.000.

Couper, Robert A.; and Lillie, Terrance L., to Pitney Bowes Inc. Cursor control circuit for plural displays for use in a word processing system. 4,434,419, Cl. 340-717.000.

Courtaulds Limited: *See*—
Betts, Max W., 4,433,560, Cl. 66-64.000.

Courvoisier, Guy; and Arieh, Simon, to Lange International S.A. Article of clothing or accessory intended to adapt itself closely to a part of the human body and a process for adapting this article or accessory to this part of the human body. 4,433,494, Cl. 36-119.000.

Cousens, Donald E.: *See*—
Kurtz, John A.; and Cousens, Donald E., 4,434,347, Cl. 219-56.220.

Covitch, Michael J., to Diamond Shamrock Corporation. Method for making a porous fluorinated polymer structure. 4,434,116, Cl. 264-49.000.

Cox, Bruce M.; and Stephenson, Stanley V., to Halliburton Company. Polymer flood mixing apparatus and method. 4,433,701, Cl. 137-101.190.

Cox, Ian R.; and Jones, Keith, to Lever Brothers Company. Novel sulphosuccinates and detergent compositions containing them. 4,434,091, Cl. 252-557.000.

Cox, Ian R.: *See*—
Hampson, Jeffrey D.; Billington, Reginald; and Cox, Ian R., 4,434,090, Cl. 252-547.000.

CPG Products Corp.: *See*—
Pelavin, Joseph Y., 4,433,760, Cl. 190-115.000.

Craig, Lawrence B.; and Farina, Alfred J. Pump impeller. 4,433,967, Cl. 418-140.000.

Craig, Timothy P.; Pettit, John W.; and Timperman, Michael R., to International Business Machines Corporation. Regulated current source for thermal printhead. 4,434,356, Cl. 219-216.000.

Crane, Jacob: *See*—
Saleh, Yousef; Breedis, John F.; and Crane, Jacob, 4,434,016, Cl. 148-12.70C.

Crank, James D., to Ampex Corporation. High rate sputtering system and method. 4,434,037, Cl. 204-192.00R.

Crawford, James R.: *See*—
Salmon, Joe E.; Strother, Fleetwood E.; and Crawford, James R., 4,433,454, Cl. 19-55.00R.

Critical Fluid Systems, Inc.: *See*—
Eppig, Christopher P.; Putnam, Bruce M.; and de Filippi, Richard P., 4,434,028, Cl. 196-14.520.

Crompton, Edward E., Jr. Vehicle sway damper. 4,433,865, Cl. 296-1.00S.

Crossan, Stephen C.: *See*—
Abbott, Jerry J.; Crossan, Stephen C.; Fuller, Sterritt R., Jr.; and Jachimiak, Paul D., 4,434,220, Cl. 430-108.000.

Crossman, Richard L., to Goodyear Aerospace Corporation. Brake adjuster having a rod drawn through a draw ring. 4,433,758, Cl. 188-196.00R.

Crouch, Ronald A. Dual warning parking aid. 4,433,636, Cl. 116-28.00R.

Cruickshank, Philip A.; and Cullen, Thomas G., to FMC Corporation. Insecticidal substituted-biphenylmethyl oxime ethers. 4,434,182, Cl. 424-327.000.

Cullen, Thomas G.: *See*—
Cruickshank, Philip A.; and Cullen, Thomas G., 4,434,182, Cl. 424-327.000.

Cunningham, Byron H. Oil storage tank extinguisher. 4,433,733, Cl. 169-49.000.

Curran, Kenneth J., to Vivitar Corporation. Exposure meter. 4,433,914, Cl. 356-223.000.

Cushing, Richard D.: *See*—
Beck, Alfred E.; and Cushing, Richard D., 4,433,640, Cl. 118-323.000.

Custom Oilfield Products, Inc.: *See*—
Redmon, Billy L.; and Forester, Buford G., 4,433,827, Cl. 251-191.000.

Dabbish, Ezzat A.: *See*—
Levine, Stephen N.; Dabbish, Ezzat A.; and Byrns, John P., 4,434,323, Cl. 178-22.170.

Dagenhart, William K.; Haselton, Halsey H.; Stirling, William L.; and Whealton, John H., to United States of America, Energy. Neutral beamline with improved ion energy recovery. 4,434,131, Cl. 376-130.000.

D'Agnolo, Armando, to Officine Savio S.p.A. Tube which can be axially stacked. 4,433,815, Cl. 242-118.000.

Daido Tokushuko Kabushiki Kaisha: *See*—
Kato, Tetsuo; Abeyama, Shozo; Kimura, Atsuyoshi; Sekiya, Shigenobu; and Nakamura, Sadayuki, 4,434,006, Cl. 75-123.00R.

Dailey, Jack R.; Kuntzleman, Harry C.; Ng, Charles S.; and Pike, John W., to International Business Machines Corporation. Universal image coder and controller for multicolor electrolytic printing. 4,434,432, Cl. 346-154.000.

Daimler-Benz Aktiengesellschaft: *See*—
Abt, Reinhold; Blum, Walter; and Bordovsky, Jaromir, 4,433,613, Cl. 91-358.00R.

Dainippon Ink and Chemicals, Inc.: *See*—
Teshirogi, Takuma, 4,434,285, Cl. 528-86.000.

Danfoss A/S: *See*—
Thorsen, Niels P., 4,433,555, Cl. 62-154.000.

Darnall, Larry N., to FMC Corporation. Suspended loop ammunition magazine. 4,433,609, Cl. 89-34.000.

Darrichard, Louis D.; and Plaisant, Jacques, to Valeo. Glass fibre yarns and other goods, and method of manufacture. 4,433,535, Cl. 57-229.000.

Darrow, Russell E.; Funari, Joseph; Kotrch, George S.; and Phillips, George C., to International Business Machines Corporation. Pinned ceramic substrate. 4,434,134, Cl. 419-5.000.

Data General Corporation: *See*—
Holland, Charles J.; Wallach, Steven; and Alsing, Carl J., 4,434,459, Cl. 364-200.000.

Datapoint Corporation: *See*—
Witten, Franklyn H.; and Kline, Sherman S., 4,433,881, Cl. 312-107.500.

Daugherty, Charles W.: *See*—
McGary, Charles W., Jr.; Pascarella, Vincent J.; Taller, Robert A.; Rhodes, Delmer R.; Anglin, Paul E.; and Daugherty, Charles W., 4,434,126, Cl. 264-303.000.

David, Agoston: *See*—
Horvath, Tibor; Udvardy, Agnes; David, Agoston; and Marmarosi nee Kellner, Katalin, 4,434,152, Cl. 424-19.000.

Davies, Hywel R.: *See*—
Vitols, Reinhards; Walkinshaw, Steven; Baker, John E.; Davies, Hywel R.; and Woodward, Adrian M., 4,433,561, Cl. 66-148.000.

Davis, Delbert A.: *See*—
Fash, William G.; and Davis, Delbert A., 4,434,200, Cl. 428-257.000.

Davis, Pauls; and Wilson, Joe C., to BASF Wyandotte Corporation. Novel aliphatic sulfosiloxane-silicate copolymers. 4,434,065, Cl. 252-75.000.

Dawn Designs, Inc.: *See*—
Payne, Rex E., Jr.; and Hoffman, Ronald R., 4,433,869, Cl. 297-5.000.

Dawson, Michael L.: *See*—
Hochwitz, Lynn E.; Schaefer, Daniel W.; and Dawson, Michael L., 4,433,868, Cl. 296-190.000.

Day, David R.: *See*—
McElroy, Lucian G.; and Day, David R., 4,433,450, Cl. 15-316.00R.

Day, J. Michael. Active lighting system including light control keyboard. 4,434,454, Cl. 362-238.000.

Dayco Corporation: *See*—
Hollaway, Gerald C., Jr., 4,434,019, Cl. 156-137.000.

dbx, Inc.: *See*—
Welland, David R., 4,434,380, Cl. 307-491.000.

DeAmicis, Ferdinando. Portable cooking implement. 4,433,671, Cl. 126-9.00R.

Dean, Robert R.; Mauleon, Jean L.; and Newman, Robert J. Residual oil feed process for fluid catalyst cracking. 4,434,049, Cl. 208-153.000.

Debouzie, Alain; Sainte-Foi, Daniel; and Blandin, Yannick, to Isover Saint-Gobain. Process and apparatus for forming mineral fibers. 4,433,992, Cl. 65-3.100.

Deck the Halls, Inc.: *See*—
Maravelas, William S., Jr.; Bighley, Alexandria D.; and Calabrese, Marco A., 4,433,880, Cl. 312-3.000.

Decuq, Guy, to Verdol S.A. Mechanical cording and heald system controlled by pulleys. 4,433,704, Cl. 139-66.00R.

Deeba, Michel; Ambs, William J.; and Cochran, Robert N., to Air Products and Chemicals, Inc. Methanol amination. 4,434,300, Cl. 564-479.000.

Deere & Company: *See*—
Anstey, Henry D.; Meiers, Gerald F.; and Koning, Richard W., 4,433,619, Cl. 100-40.000.
Giani, Angel, 4,433,533, Cl. 56-341.000.
Hauser, Herbert J., Jr., 4,433,616, Cl. 92-190.000.
McCunn, Myron L., 4,433,532, Cl. 56-320.200.

de Filippi, Richard P.: *See*—
Eppig, Christopher P.; Putnam, Bruce M.; and de Filippi, Richard P., 4,434,028, Cl. 196-14.520.
DeFusco, Albert A., Jr.; Nielsen, Arnold T.; and Atkins, Ronald L., to United States of America, Navy. Synthesis of trinitrophloroglucinol. 4,434,304, Cl. 568-710.000.
Degen, Bruno: *See*—
Sattlegger, Hans; Schnurrbusch, Karl; Degen, Bruno; and Achtenberg, Theo, 4,434,283, Cl. 528-34.000.
DeGeorge, Richard M.: *See*—
Kenol, Claude J.; and DeGeorge, Richard M., 4,434,422, Cl. 343-5.0SC.
De Goede, Roland: *See*—
Delwel, Francois; and De Goede, Roland, 4,434,068, Cl. 252-135.000.
DeGraw, Kenneth J.; Wilcockson, Brian; Nickerson, Earl W.; Bocchini, William R.; Bogossian, Armen; and Proios, Steve, to American Standard Inc. Self-contained flow through sewage waste disposal system. 4,433,443, Cl. 4-317.000.
Degussa Aktiengesellschaft: *See*—
Bach, Gerhard; Geiger, Friedhelm; Heimberger, Werner; Schreyer, Gerd; and Hillenbrand, Horst, 4,434,148, Cl. 423-379.000.
Kleinschmit, Peter; Voll, Manfred; and Engel, Richard, 4,434,135, Cl. 422-150.000.
Deis, Daniel W.; McNab, Ian R.; and Smith, Joseph L., Jr., to Westinghouse Electric Corp. Electromagnetic projectile launcher with an augmented breech. 4,433,608, Cl. 89-8.000.
Delalande S.A.: *See*—
Dostert, Philippe; Imbert, Thierry; and Bucher, Bernard, 4,434,170, Cl. 424-265.000.
Delaney, Rory A. M.: *See*—
Desia, Nitin; Delaney, Rory A. M.; Brouwer, Peter; and Huang, Victor T., 4,434,186, Cl. 426-565.000.
Delatorre, Leroy C. Pressure sensors. 4,434,451, Cl. 361-283.000.
Delwel, Francois; and De Goede, Roland, to Lever Brothers Company. Process for manufacturing detergent speckles. 4,434,068, Cl. 252-135.000.
De Munck, Nicolaas A.; and Scholten, Joseph J. F., to Stamicarbon B.V. Process and catalyst for performing hydroformylation reactions. 4,434,302, Cl. 568-454.000.
Den, Hiroshi: *See*—
Shima, Eiji; Den, Hiroshi; and Kuroki, Takeo, 4,434,377, Cl. 307-147.000.
Densmore, Neal W., to Joy Manufacturing Company. Conveyor belt drive sprocket. 4,433,777, Cl. 198-834.000.
Dernedde, Robert; and Koch, Jurgen, to Klein, Schanzlin & Becker Aktiengesellschaft. Stress-resistant mount for the casing of a centrifugal pump. 4,433,825, Cl. 248-672.000.
DeSatnick, Allen H.: *See*—
Burke, Roger M.; DeSatnick, Allen H.; and Honkanen, George P., 4,433,687, Cl. 128-318.000.
Desia, Nitin; Delaney, Rory A. M.; Brouwer, Peter; and Huang, Victor T., to Pillsbury Company, The. Stable aerated frozen food product. 4,434,186, Cl. 426-565.000.
Despres, Bernard: *See*—
Meinguss, Alain; and Despres, Bernard, 4,434,361, Cl. 235-192.000.
Detty, Michael R.; Murray, Bruce J.; and Perlstein, Jerome H., to Eastman Kodak Company. Substituted benzotelluropyrones. 4,434,098, Cl. 260-239.00R.
Deutsch Fastener Corp.: *See*—
Molina, Jorge W., 4,433,459, Cl. 24-613.000.
Devault, Michel A.: *See*—
Quinquis, Jean-Paul; and Devault, Michel A., 4,434,463, Cl. 364-200.000.
De Vries, Jacob: *See*—
Halder, Mathis; Widmer, Jakob; and De Vries, Jacob, 4,434,400, Cl. 324-110.000.
de Vries, Paul. Keyboard musical instrument. 4,433,602, Cl. 84-1.060.
Diamond Crystal Salt Company: *See*—
Chandler, William S.; Wilkens, Walter F.; and Heiss, John F., 4,434,187, Cl. 426-652.000.
Diamond, Julius; and Wohl, Ronald A., to Berlex Laboratories, Inc. Treating cardiovascular diseases with N-(3-phenoxy-2-hydroxypropyl)benzimidazole-1-alkanamines. 4,434,174, Cl. 424-273.00B.
Diamond Shamrock Corporation: *See*—
Covitch, Michael J., 4,434,116, Cl. 264-49.000.
Dibrell, Edwin W., to Centrifugal Piston Expander, Inc. Method and apparatus for deriving mechanical energy from a heat source. 4,433,551, Cl. 62-87.000.
Dickey, Larry W., to Bell Telephone Laboratories, Incorporated. Protector unit for telecommunications circuits. 4,434,449, Cl. 361-124.000.
Dickinson, Robert H. Soap powder package. 4,433,783, Cl. 206-484.000.
Diedrich, William: *See*—
DuVal, Alvin J., 4,433,463, Cl. 29-239.000.
Dietrich, Rodney J. P. Building component, method of construction and wall formed thereby. 4,433,521, Cl. 52-302.000.
Digital Equipment Corporation: *See*—
Rubinson, Barry L.; Parenti, Mark A.; Lary, Richard F.; and Gardner, Edward A., 4,434,487, Cl. 371-10.000.
Dills, Raymond L., to General Electric Company. Self-storing meal rack for a microwave oven. 4,434,344, Cl. 219-10.55E.
Dimpfl, William L.; and Blanton, William A., to Chevron Research Company. Simultaneous sulfur oxide and nitrogen oxide control in FCC units using cracking catalyst fines with ammonia injection. 4,434,147, Cl. 423-235.000.
Dinarello, Charles A. Human leukocytic pyrogen test for the detection of exogenous fever-producing substances. 4,434,237, Cl. 436-542.000.
Dion, Yvon: *See*—
Pelletier, Jean-Marc; and Dion, Yvon, 4,434,413, Cl. 337-71.000.
Ditgens, Klaus: *See*—
Heinemann, Ulrich; Thomas, Rudolf; Lantzsch, Reinhard; Ditgens, Klaus; and Weber, Erhard, 4,434,292, Cl. 548-373.000.
Dr. Ing. Rudolf Hell GmbH: *See*—
Schwartz, Robert, 4,433,912, Cl. 356-150.000.
Doherty, James B.; Chang, Michael N.; and Dorn, Conrad P., to Merck & Co., Inc. Nonsteroidal compounds as anti-inflammatory and analgesic agents. 4,434,175, Cl. 424-274.000.
Dohet, Pierre E. Panel structure. 4,433,700, Cl. 135-97.000.
Dohi, Masaji: *See*—
Ishizaki, Hiroyuki; Tsujino, Yoshiki; and Dohi, Masaji, 4,434,441, Cl. 358-213.000.
Doleschall, Gabor: *See*—
Lempert, Karoly; Harsanyi, Kalman; Doleschall, Gabor; Hornyak, Gyula; Nyitrai, Jozsef; Zauer, Karoly; Fetter, Jozsef; Simig, Gyula; Gombos nee Visky, Zsuzsanna; and Szalai nee Barta, Gizella, 4,434,099, Cl. 260-239.00A.
Dombek, Bernard D., to Union Carbide Corporation. Continuous process for the manufacture of ethylene glycol. 4,434,247, Cl. 518-700.000.
Dominion Engineering Works Limited: *See*—
Scuccato, Serge L.; and Shaver, Marvin B., 4,433,769, Cl. 192-0.098.
Donath, Jeno: *See*—
Keszei, Jeno; Varga, Laszlo; and Donath, Jeno, 4,433,485, Cl. 33-3.00R.
Dorn, Conrad P.: *See*—
Doherty, James B.; Chang, Michael N.; and Dorn, Conrad P., 4,434,175, Cl. 424-274.000.
Doroszkowsky, Andrew; and Pavey, Victor J., to Imperial Chemical Industries PLC. Manufacture of polymer dispersions. 4,434,268, Cl. 524-520.000.
Dorrestijn, Antoon; Lemstra, Pieter J.; and Van Unen, Lambert H. T., to Stamicarbon B.V. Rigid polyvinyl chloride foam. 4,434,252, Cl. 521-134.000.
Dostert, Philippe; Imbert, Thierry; and Bucher, Bernard, to Delalande S.A. Nor-tropane derivatives, and their application in therapeutics. 4,434,170, Cl. 424-265.000.
Double E Company Inc.: *See*—
Pontes, Virgil M.; and Young, Lawrence C., 4,433,814, Cl. 242-72.100.
Dow Chemical Company, The: *See*—
Esneault, Calvin P., 4,434,282, Cl. 526-125.000.
Lee, John M.; and Bauman, William C., 4,434,138, Cl. 423-7.000.
Dow Corning Corporation: *See*—
Baile, Madhu, 4,434,127, Cl. 264-236.000.
Skostins, Olgerts, 4,434,195, Cl. 427-387.000.
Down, Michael G.; Phillips, D. Colin; and Emmerich, Werner S., to Westinghouse Electric Corp. System for the production of ketene and methylene from carbonate minerals. 4,434,133, Cl. 376-323.000.
Doyle, Gerald; Pruett, Roy L.; and Savage, David W., to Exxon Research and Engineering Company. Separation and recovery of unsaturated hydrocarbons by copper (I) complexes. 4,434,317, Cl. 585-845.000.
Drakenborn, Karl-Gunnar; Enser, Mats A.; Grebner, Kurt G. E.; and Wallmark, Erik I., to International Business Machines Corporation. Hierarchical computer system for generating selective output signals in response to received input signals. 4,434,460, Cl. 364-200.000.
Dresp, Gerd: *See*—
Plica, Peter; Schmoller, Karl; and Dresp, Gerd, 4,433,944, Cl. 405-284.000.
Driver, Gary R.; and Herman, Richard J., to NL Industries, Inc. Wellhead connector with release mechanism. 4,433,859, Cl. 285-34.000.
Dubois, Pierre-Yves: *See*—
Dubois, Robert; and Dubois, Pierre-Yves, 4,434,190, Cl. 427-136.000.
Dubois, Robert; and Dubois, Pierre-Yves, to Selfixat, S.A. Process for preventing formation of black ice on roads by applying a mixture of salt and aqueous fixation composition onto the road surface. 4,434,190, Cl. 427-136.000.
Ducrocq, Claire: *See*—
Bisagni, Emile; Ducrocq, Claire; Rivalle, Christian; Tambourin, Pierre; Wendling, Francoise; Civier, Alain; Montagnier, Luc; Chermann, Jean-Claude; Gruest, Jacqueline; and Lidereau, Rosette, 4,434,290, Cl. 546-70.000.
Dumm, Heinz; Koerner, Gotz; Krakenberg, Manfred; Rott, Hans; and Schmidt, Gunter, to Th. Goldschmidt AG. Substantive preparation material for yarns or plied yarns. 4,434,008, Cl. 106-271.000.
Dunford, James M.: *See*—
Shih, Kelvin; Pochert, Kurt A.; and Dunford, James M., 4,433,576, Cl. 73-204.000.
Dunnebier, Horst: *See*—
Kratzer, Adolf; and Dunnebier, Horst, 4,433,947, Cl. 406-99.000.
Dunnrowicz, Clarence J.; and Callerame, Joseph, to Raytheon Company. Ultrasonic transducer and its method of manufacture. 4,434,384, Cl. 310-325.000.
Du Pont de Nemours, E. I., and Company: *See*—
Barnette, Willie J., 4,434,316, Cl. 585-833.000.
Brugel, Edward G.; and Yllo, Walter, 4,434,261, Cl. 524-109.000.

Coleman, Patrick L.; and Wehrly, John A., 4,434,096, Cl. 260-112.50R.
Freytag, J. William, 4,434,236, Cl. 436-512.000.
Hicks, William T.; and Seidel, William C., 4,434,084, Cl. 252-512.000.
Ramsey, Harold E.; and Fischer, Edward E., 4,433,527, Cl. 53-548.000.
Rys-Sikora, John, 4,434,253, Cl. 521-134.000.
Schumacher, Frederick G.; and Yllo, Walter, 4,434,258, Cl. 524-13.000.
Seppala, Earl E., 4,433,509, Cl. 49-352.000.
Uschold, Ronald E., 4,434,273, Cl. 525-326.200.

Durenec, Peter, to United States of America, Army. Free piston displacer control means. 4,433,550, Cl. 62-6.000.

DuVal, Alvin J., to Diedrich, William, a part interest. Multipurpose prying tool. 4,433,463, Cl. 29-239.000.

Dworak, Gert; and Staritzbichler, Werner, to Vianova Kunstharz, A.G. Paint binders. 4,434,256, Cl. 523-402.000.

Dyckerhoff & Widmann Aktiengesellschaft: *See*—
Plica, Peter; Schmoller, Karl; and Dresp, Gerd, 4,433,944, Cl. 405-284.000.

Dyson, Herbert C. Device and method for cutting circular piece parts. 4,434,015, Cl. 148-9.00R.

E.C.H. Will (GmbH & Co.): *See*—
Jendrusch, Paul, 4,433,773, Cl. 198-467.000.

Earll, Jeffrey P.: *See*—
Jones, Larren F.; and Earll, Jeffrey P., 4,433,496, Cl. 37-141.00R.

Eastman Kodak Company: *See*—
Detty, Michael R.; Murray, Bruce J.; and Perlstein, Jerome H., 4,434,098, Cl. 260-239.00R.
Larkins, Thomas H., Jr., 4,434,241, Cl. 502-24.000.
Wilgus, Herbert S.; and Haefner, John A., 4,434,226, Cl. 430-567.000.

Easy-Do Products Limited: *See*—
Neumann, Solomon, 4,434,192, Cl. 427-282.000.

Eaton Corporation: *See*—
Goscenski, Edward J., Jr., 4,433,764, Cl. 192-18.00R.
Green, Edward A., 4,433,591, Cl. 74-479.000.
Klein, Gary S.; and Herbert, William J., 4,434,320, Cl. 174-23.00R.

Ebi, Yutaka: *See*—
Horike, Masanori; and Ebi, Yutaka, 4,434,428, Cl. 346-75.000.

Eckert, Robert J.; and Keene, Frederick R., Jr., to Western Electric Co., Inc. Treating articles in an array with streams of a medium. 4,434,012, Cl. 134-25.400.

Edge, David J.: *See*—
Billington, Reginald; Edge, David J.; and Winterbotham, Peter, 4,434,088, Cl. 252-547.000.
Billington, Reginald; Edge, David J.; and Winterbotham, Peter, 4,434,089, Cl. 252-547.000.

Edstrom, John O.; and Gorling, Karl G., to SKF Steel Engineering AB. Method for manufacturing metal from fine-grain metal-oxide material. 4,434,001, Cl. 75-3.000.

Edwards, Ralston G., Jr.; Walkden, John R. B.; Carstensen, Walter H.; Murphy, Gregory E.; and Lisi, John E., to Owens-Illinois, Inc. Driven roller tube conveyor. 4,433,776, Cl. 198-779.000.

Edwards, Thomas M.; Kelley, James O.; and Beard, Michael D., to Herman Miller, Inc. Work surface support system. 4,433,884, Cl. 312-256.000.

Eichler, Jurgen; Herz, Claus; and Neisius, Karl-Heinz, to Merck Patent Gesellschaft mit beschrankter Haftung. Mixtures of aromatic-aliphatic ketones as photoinitiators and photopolymerizable systems containing them. 4,434,035, Cl. 204-159.130.

Eicken, Heinz T.: *See*—
Eisermann, Armin; Eicken, Heinz T.; and Geiger, Diethard, 4,433,772, Cl. 194-59.000.

Eisai Co., Ltd.: *See*—
Tanaka, Ichiro; Arato, Hiroshi; and Wakabayashi, Takaaki, 4,434,166, Cl. 424-250.000.

Eisenberg, James: *See*—
Van Wyk, Richard; and Eisenberg, James, 4,433,621, Cl. 101-11.000.

Eisermann, Armin; Eicken, Heinz T.; and Geiger, Diethard, to Schulte-Schlagbaum AG. Lock with locking function adapted to be actuated after the insertion of a coin. 4,433,772, Cl. 194-59.000.

El Paso Polyolefins Company: *See*—
Ficker, Harold K., 4,434,264, Cl. 524-323.000.

Elco Corporation: *See*—
Cassarly, James W.; Rollings, Robert W.; and Youngfleish, Frank C., 4,433,886, Cl. 339-14.00R.

Electric Power Research Institute, Inc.: *See*—
Hemmat, Naim, 4,433,474, Cl. 29-605.000.
Hingorani, Narain G., 4,434,376, Cl. 307-102.000.
Patel, Mukunk R.; and Nathenson, Richard D., 4,434,382, Cl. 310-51.000.

Electricity Council, The: *See*—
Simpson, David P.; and Stirling, Robert, 4,434,357, Cl. 219-291.000.

Electrochemical Technology Corp.: *See*—
Ballestrasse, Cindy L.; and Ruggeri, Robert T., 4,434,249, Cl. 521-27.000.

Electronique Marcel Dassault: *See*—
Meinguss, Alain; and Despres, Bernard, 4,434,361, Cl. 235-192.000.

Eli Lilly and Company: *See*—
Wikel, James H., II, 4,434,288, Cl. 544-54.000.

Ellis, David E.: *See*—
Benard, David J.; Pchelkin, Nicholas R.; McDermott, William E.; Ellis, David E.; and Miller, George W., 4,434,492, Cl. 372-59.000.

Ellis, Karen E. Greeting card. 4,433,780, Cl. 206-232.000.

Ellman, Alan G.: *See*—
Garito, Jon C.; and Ellman, Alan G., 4,433,960, Cl. 433-215.000.

Elms, Robert T., to Westinghouse Electric Corp. Motor control apparatus with parallel input, serial output signal conditioning means. 4,434,390, Cl. 318-473.000.

Emmerich, Werner S.: *See*—
Down, Michael G.; Phillips, D. Colin; and Emmerich, Werner S., 4,434,133, Cl. 376-323.000.

Emshoff, Horst W.; and Kusebauch, Walter, to Siemens Aktiengesellschaft. Cooling arrangement and method of operating the arrangement. 4,434,058, Cl. 210-662.000.

Endo, Hiroshi: *See*—
Ishikawa, Yasuki; Endo, Hiroshi; Sone, Masazumi; and Imai, Iwao, 4,433,669, Cl. 123-620.000.

Endo, Norio: *See*—
Sawada, Shizuo; Ogura, Mitsugi; and Endo, Norio, 4,433,911, Cl. 355-125.000.

Energy Profiles, Inc.: *See*—
Salisbury, Winfield W., 4,434,130, Cl. 376-107.000.

Engebretson, Harold J.: *See*—
Ott, Paul W.; Engebretson, Harold J.; LaHue, Philip M.; and Van Steenwyk, Brett H., 4,433,491, Cl. 33-302.000.

Engel, Richard: *See*—
Kleinschmit, Peter; Voll, Manfred; and Engel, Richard, 4,434,135, Cl. 422-150.000.

Enser, Mats A.: *See*—
Drakenborn, Karl-Gunnar; Enser, Mats A.; Grebner, Kurt G. E.; and Wallmark, Erik I., 4,434,460, Cl. 364-200.000.

Eppig, Christopher P.; Putnam, Bruce M.; and de Filippi, Richard P., to Critical Fluid Systems, Inc. Apparatus for removing organic contaminants from inorganic-rich mineral solids. 4,434,028, Cl. 196-14.520.

Epson Corporation: *See*—
Fujiwara, Hitoshi; and Matsuzawa, Masanao, 4,433,925, Cl. 400-88.000.
Koto, Haruhiko, 4,434,430, Cl. 346-140.00R.

Erickson, Donald C. Air separation with medium pressure enrichment. 4,433,989, Cl. 62-13.000.

Erlam, David P.; and Archard, Thornton N. J., to BICC Public Limited Company. Enclosures for electrical and electronic equipment. 4,433,788, Cl. 211-26.000.

Ernst, Horst M.: *See*—
Walter, Lothar; Brandenstein, Manfred; Ernst, Horst M.; and Olschewski, Armin, 4,433,875, Cl. 308-6.00R.

Escher Wyss Aktiengesellschaft: *See*—
Mulhaupt, Bruno, 4,434,052, Cl. 210-376.000.

ESCO Corporation: *See*—
Jones, Larren F.; and Earll, Jeffrey P., 4,433,496, Cl. 37-141.00R.

Esneault, Calvin P., to Dow Chemical Company, The. Process for polymerizing olefins. 4,434,282, Cl. 526-125.000.

Esser, Fred: *See*—
Pietzsch, Herbert; Lachner, Walter; Hofmann, Karlheinz; Potzsch, Erich; and Esser, Fred, 4,434,494, Cl. 373-18.000.

Etablissement Public de diffusion dit "Telediffusion de France": *See*—
Motsch, Roger; Roussel, Francoise; and Lolivier, Germain, 4,434,499, Cl. 375-122.000.

Everest, David C., III: *See*—
Chalmers, Edward L., II; and Everest, David C., III, 4,433,457, Cl. 24-68.0SK.

Evers, William J.; Mookherjee, Braja D.; Van Ouwerkerk, Anton; and Van Loveren, Augustinus G., to International Flavors & Fragrances Inc. Perfume or cologne containing 1,2,3,3,5,6-hexamethyl-bicyclo[2.2.2]-oct-5-en-2-ol. 4,434,085, Cl. 252-522.00R.

Eversdijk, Bastiaan P., to Stork Friesland B.V. Method for the evaporation of a liquid solution using mechanical compression. 4,434,027, Cl. 159-47.100.

Ex-Cell-O Corporation: *See*—
Nord, Keith W., 4,433,526, Cl. 53-244.000.

Exxon Research and Engineering Company: *See*—
Doyle, Gerald; Pruett, Roy L.; and Savage, David W., 4,434,317, Cl. 585-845.000.
Horowitz, Hugh H.; Horowitz, Harold S.; and Longo, John M., 4,434,031, Cl. 204-59.00R.
Langer, Arthur W., Jr., 4,434,312, Cl. 585-523.000.
Langer, Arthur W., Jr., 4,434,313, Cl. 585-527.000.
O'Neil, John B., 4,433,536, Cl. 57-233.000.
Oswald, Alexis A.; Huang, Helen; Huang, John; and Valint, Paul, Jr., 4,434,062, Cl. 252-8.55D.
Singhal, Gopal H.; and Nadkarni, Ramachandra A., 4,434,043, Cl. 208-10.000.
Vernon, Lonnie W.; and Jacobs, Fritz E., 4,434,045, Cl. 208-107.000.

Ezis, Andre; Samanta, Shyam K.; and Subramanian, Krishnamoorthy, to Ford Motor Company. Ceramic cutting tool formed from Si_3N_4—Y_2O_3—SiO_2 and method of making. 4,434,238, Cl. 501-98.000.

Faden, Alan I.: *See*—
Holaday, John W.; and Faden, Alan I., 4,434,168, Cl. 424-260.000.

Fair, Timothy K., Sr., to Conwed Corporation. Method of manufacturing a thin net and product. 4,434,199, Cl. 428-134.000.

Fairbairn, Leroy W.; and Waldron, Clifford R., to Bendix Corporation, The. Method of making an electrical contact. 4,433,482, Cl. 29-882.000.

Fairchild Camera & Instrument Corporation: *See*—
Ko, Wen-Chuang; and Berry, Robert L., 4,433,471, Cl. 29-578.000.
Kurtz, John A.; and Cousens, Donald E., 4,434,347, Cl. 219-56.220.

Fairchild, Meredith H., to Purex Corporation. Plastic bottle cleaner. 4,434,069, Cl. 252-174.140.
Falco Data Products: *See*—
Kachun, Lee, 4,434,472, Cl. 364-900.000.
Farina, Alfred J.: *See*—
Craig, Lawrence B.; and Farina, Alfred J., 4,433,967, Cl. 418-140.000.
Farnham, Robert A., to Chevron Research Company. Method and apparatus for level loading of vessels using catalyst oriented packing. 4,433,707, Cl. 141-1.000.
Farr, Glyn P. R., to Lucas Industries Limited. Control valve assembly. 4,433,873, Cl. 303-24.00A.
Fash, William G.; and Davis, Delbert A., to Burlington Industries, Inc. Impregnated woven fencing product. 4,434,200, Cl. 428-257.000.
Fatka, Richard J.: *See*—
Thomas, Robert C.; Hornbuckle, John A.; and Fatka, Richard J., 4,434,470, Cl. 364-565.000.
Faunce, Frank R., to JAFF Investment Company. Composite laminate dental veneer containing color systems. 4,433,959, Cl. 433-201.000.
Fay, Victor K., to Itek Corporation. A.C. Coupled video amplifier with fast pulse recovery. 4,434,404, Cl. 330-85.000.
Fearing, D. Michael: *See*—
Marks, George B., Sr.; and Fearing, D. Michael, 4,434,181, Cl. 424-326.000.
Fearing Manufacturing Co., Inc.: *See*—
Marks, George B., Sr.; and Fearing, D. Michael, 4,434,181, Cl. 424-326.000.
Federal Paper Board Co., Inc.: *See*—
Ganz, Robert H.; and Manizza, Guelfo A., 4,433,806, Cl. 229-40.000.
Ganz, Robert H., 4,433,807, Cl. 229-40.000.
Maio, Patrick S.; and Lee, John F., 4,433,778, Cl. 206-45.250.
Feeney, Frank J., to Mobil Oil Corporation. Glass filled poly(p-methylstyrene). 4,434,271, Cl. 524-575.000.
Feinleib, Morris: *See*—
Wegener, Mary J.; and Feinleib, Morris, 4,434,222, Cl. 430-135.000.
Fellman, Robert P.; Hurwitz, Marvin J.; Myers, Robert M.; and Slack, Gerald F., to Rohm and Haas Company. Permanent dental restorative material. 4,433,958, Cl. 433-199.000.
FEPS International, Ltd.: *See*—
Shima, Eiji; Den, Hiroshi; and Kuroki, Takeo, 4,434,377, Cl. 307-147.000.
Ferrell, Philip J., to Racal Data Communications Inc. Coded data transmission system. 4,434,322, Cl. 178-22.130.
Fetter, Jozsef: *See*—
Lempert, Karoly; Harsanyi, Kalman; Doleschall, Gabor; Hornyak, Gyula; Nyitrai, Jozsef; Zauer, Karoly; Fetter, Jozsef; Simig, Gyula; Gombos nee Visky, Zsuzsanna; and Szalai nee Barta, Gizella, 4,434,099, Cl. 260-239.00A.
Fiat Auto S.p.A.: *See*—
Burgio, Antonio, 4,433,659, Cl. 123-256.000.
Ficker, Harold K., to El Paso Polyolefins Company. High clarity propylene polymer compositions of improved impact strength. 4,434,264, Cl. 524-323.000.
Fields, Gary C. Remotely actuated telephone instrument connection block having instrument lockout feature. 4,434,328, Cl. 179-20.000.
Figge, Siegfried E. O.; and Leistner, Herbert E., to Sigma Tool & Machine Limited. Magazine assembly for coil nails. 4,433,782, Cl. 206-338.000.
Figgie International Inc.: *See*—
Giorgini, Eugene A.; and Sullivan, John L., 4,433,685, Cl. 128-204.260.
Findeisen, Kurt; and Ziemann, Heinz, to Bayer Aktiengesellschaft. Process for the preparation of 2-trimethylsilyloxy-ethylamines. 4,434,289, Cl. 546-14.000.
Finlayson, Claude M.: *See*—
Mardis, Wilbur S.; and Finlayson, Claude M., 4,434,075, Cl. 252-315.200.
Mardis, Wilbur S.; and Finlayson, Claude M., 4,434,076, Cl. 252-315.200.
Firey, Joseph C. Torque leveller. 4,433,547, Cl. 60-711.000.
Fischer, Edward E.: *See*—
Ramsey, Harold E.; and Fischer, Edward E., 4,433,527, Cl. 53-548.000.
Fischer & Porter Company: *See*—
Kazahaya, Masahiro, 4,434,458, Cl. 364-138.000.
Fissler Gesellschaft mit beschrankter Haftung: *See*—
Horn, Walter, 4,433,579, Cl. 73-715.000.
Fitzner, Arthur O., to Brunswick Corporation. Capacitor discharge ignition system having a charging control means. 4,433,668, Cl. 123-597.000.
Fitzpatrick, James J. Steam boilers. 4,433,644, Cl. 122-114.000.
Flam, Eric: *See*—
Allen, Douglas, Jr.; and Flam, Eric, 4,434,254, Cl. 523-105.000.
Flight Systems, Inc.: *See*—
York, Robert A., 4,434,401, Cl. 324-158.0SC.
Flisikowski, Peter; Jeglinski, Werner; and Jelmorini, Gerardus, to U.S. Philips Corporation. Method of and device for manufacturing an ink jet printer. 4,434,350, Cl. 219-121.0LC.
FluiDyne Engineering Corporation: *See*—
Lindahl, Bruce C., 4,433,631, Cl. 110-245.000.
FMC Corporation: *See*—
Cruickshank, Philip A.; and Cullen, Thomas G., 4,434,182, Cl. 424-327.000.
Darnall, Larry N., 4,433,609, Cl. 89-34.000.
Hill, Ronald L., 4,433,578, Cl. 73-487.000.
Nelson, Paul M., 4,434,185, Cl. 426-308.000.
Ford Motor Company: *See*—
Ezis, Andre; Samanta, Shyam K.; and Subramanian, Krishnamoorthy, 4,434,238, Cl. 501-98.000.
Forester, Buford G.: *See*—
Redmon, Billy L.; and Forester, Buford G., 4,433,827, Cl. 251-191.000.
Formall Syn-Trac Systems, Inc.: *See*—
Forshee, David J., 4,433,627, Cl. 104-95.000.
Forshee, David J., to Formall Syn-Trac Systems, Inc. Plastic conveyor trolley with bearings. 4,433,627, Cl. 104-95.000.
Fory, Werner: *See*—
Rempfler, Hermann; and Fory, Werner, 4,433,998, Cl. 71-94.000.
Foster, Edwin E.; Foster, Wilbur A.; and Foster, Thomas E., to Majik-Ironers, Inc. Iron and ironing board support. 4,433,497, Cl. 38-107.000.
Foster, Thomas E.: *See*—
Foster, Edwin E.; Foster, Wilbur A.; and Foster, Thomas E., 4,433,497, Cl. 38-107.000.
Foster, Wilbur A.: *See*—
Foster, Edwin E.; Foster, Wilbur A.; and Foster, Thomas E., 4,433,497, Cl. 38-107.000.
Fowks, William R., to Rockwell International Corporation. Lamp housing assembly primarily for the lamp of a rubidium frequency standard. 4,434,406, Cl. 331-3.000.
Fox, Daniel W.; Miller, George P.; and Weech, Marx E., to General Electric Company. Volume reduction and encapsulation process for water containing low level radioactive waste. 4,434,074, Cl. 252-628.000.
Franey, Terence E., to International Business Machines Corporation. Radiation hardened lift-off correction medium and process of manufacture. 4,434,207, Cl. 428-343.000.
Frank, Robert G., to PPG Industries, Inc. Glass sheet shaping and tempering using multiple cooling stations. 4,433,993, Cl. 65-104.000.
Frano, Francis G. Self retained plastic cable guide and door stop. 4,433,452, Cl. 16-2.000.
Fraser, Charles E. O. Method and apparatus for the support of animals. 4,433,643, Cl. 119-103.000.
Frauenkron, Gunter: *See*—
Linder, Wolfgang; Arend, Gunter; Barnikel, Carl-Dieter; and Frauenkron, Gunter, 4,434,070, Cl. 523-323.000.
Frazier, Gary A., to Texas Instruments Incorporated. Coaxial optical fiber connector. 4,433,896, Cl. 350-96.210.
Frederickson Communications, Inc.: *See*—
Fredrickson, Dennis L., 4,434,504, Cl. 455-32.000.
Fredrickson, Dennis L., to Frederickson Communications, Inc. Channeling and decode circuit for airborne radio-telephone systems. 4,434,504, Cl. 455-32.000.
Freytag, J. William, to Du Pont de Nemours, E. I., and Company. Immunoassay wherein labeled antibody is displaced from immobilized analyte-analogue. 4,434,236, Cl. 436-512.000.
Frick Company: *See*—
Pollock, John J., 4,434,112, Cl. 261-153.000.
Frick, Georg; Reiff, Harro; and Kirsch, Alois, to Karl Mengele & Sohne. Gate shears, saw and milling tool on common carriage. 4,433,467, Cl. 29-565.000.
Fricker, Siegfried. Wall panel alignment system. 4,433,516, Cl. 52-126.300.
Friedli, Paul; and Suss, Hans G., to Inventio AG. Apparatus for controlling the access of processors at a data line. 4,434,466, Cl. 364-200.000.
Friedmann & Maier Aktiengesellschaft: *See*—
Brasseur, Georg, 4,434,392, Cl. 318-696.000.
Frient, John A.: *See*—
Morris, George R.; and Frient, John A., 4,433,445, Cl. 4-325.000.
Fritz, Adolf R., to Robert Bosch GmbH. Engine ignition system. 4,433,670, Cl. 123-644.000.
Fueglister, Alfred. Heat exchanger having pipe coils supported in support plates. 4,433,722, Cl. 165-162.000.
Fuel Systems Management: *See*—
Highfield, William, 4,434,110, Cl. 261-36.00A.
Fuji Jukogyo Kabushiki Kaisha: *See*—
Satoh, Tetsuo; Ohgami, Masaaki; and Ogata, Shoji, 4,433,748, Cl. 180-247.000.
Fuji Photo Film Co., Ltd.: *See*—
Yokota, Masazi; and Noguchi, Masaru, 4,433,893, Cl. 350-3.610.
Fuji Xerox Co., Ltd.: *See*—
Ohkubo, Tetsuo; Arai, Yoshio; and Kataoka, Hiroyuki, 4,434,431, Cl. 346-154.000.
Fujii, Shigeo; Ikeda, Tokuzo; Mikami, Takashi; and Okano, Shuji, to Toa Nenryo Kogyo Kabushiki Kaisha. Artificial leathers. 4,434,205, Cl. 428-218.000.
Fujikura Cable Works, Ltd., The: *See*—
Gomi, Yoshiaki; Hirata, Takahiro; Takaoka, Michio; Mohtai, Tsuneaki; and Akashi, Kazuya, 4,434,319, Cl. 174-13.000.
Shima, Eiji; Den, Hiroshi; and Kuroki, Takeo, 4,434,377, Cl. 307-147.000.
Fujimaki, Hiroto: *See*—
Fukuda, Hiroyuki; Kaji, Hisatsugu; and Fujimaki, Hiroto, 4,434,206, Cl. 428-288.000.
Fujimoto, Makoto, to Matsushita Electric Industrial Co., Ltd. Solid state color imaging apparatus. 4,434,435, Cl. 358-44.000.
Fujimura, Takashi; and Takahashi, Katsuyu, to Hitachi, Ltd. Method of manufacturing curved discharge tubes. 4,433,994, Cl. 65-110.000.

Fujioka, Yoshiki: *See—*
Suzuki, Hitoshi; Takahashi, Shigekatsu; and Fujioka, Yoshiki, 4,434,464, Cl. 364-200.000.
Fujita, Hiromu, to Osaka Taiyu Co., Ltd. Apparatus for rotating pallet. 4,433,954, Cl. 414-757.000.
Fujitsu Fanuc Limited: *See—*
Kobari, Katsuo; Ishida, Hiroshi; and Ota, Naoto, 4,434,393, Cl. 318-757.000.
Fujitsu Limited: *See—*
Ishizaki, Hiroyuki; Tsujino, Yoshiki; and Dohi, Masaji, 4,434,441, Cl. 358-213.000.
Matsuda, Kazuo; Ohashi, Makoto; Satoh, Yoshio; Miyashita, Tsutomu; and Komenou, Kazunari, 4,434,476, Cl. 365-12.000.
Fujiwara, Hitoshi; and Matsuzawa, Masanao, to Epson Corporation; and Kabushiki Kaisha Suwa Seikosha. Manually-operated dot printer for pocket sized calculators. 4,433,925, Cl. 400-88.000.
Fujiwara, Ryuhei; Kai, Tomokazu; and Nakahara, Hidetoshi, to Nippon Electric Co., Ltd. Circuit arrangement for protecting a control channel from jamming waves in a radio communication system. 4,434,506, Cl. 455-53.000.
Fukuda, Hiroyuki; Kaji, Hisatsugu; and Fujimaki, Hiroto, to Kureha Kagaku Kogyo Kabushiki Kaisha. Shaped articles of porous carbon fibers. 4,434,206, Cl. 428-288.000.
Fukuhara, Seiichi: *See—*
Fukushima, Eiji; Fukuhara, Seiichi; and Hiraga, Masaharu, 4,433,564, Cl. 72-146.000.
Fukumitsu, Akira, to Tokyo Shibaura Denki Kabushiki Kaisha. Automatic loading apparatus. 4,434,480, Cl. 369-77.200.
Fukushima, Eiji; Fukuhara, Seiichi; and Hiraga, Masaharu, to Sanden Corporation. Scroll manufacturing tool. 4,433,564, Cl. 72-146.000.
Fukutake, Katsuhiko: *See—*
Yorifuji, Yuki; Uyama, Seiichi; Fukutak.., Katsuhiko; and Miyazaki, Masaharu, 4,434,363, Cl. 250-214.00B.
Fuller, Sterritt R., Jr.: *See—*
Abbott, Jerry J.; Crossan, Stephen C.; Fuller, Sterritt R., Jr.; and Jachimiak, Paul D., 4,434,220, Cl. 430-108.000.
Funari, Joseph: *See—*
Darrow, Russell E.; Funari, Joseph; Kotrch, George S.; and Phillips, George C., 4,434,134, Cl. 419-5.000.
Furukawa Denchi Kabushiki Kaisha: *See—*
Suzuki, Shogo, 4,434,214, Cl. 429-59.000.
Furukawa Electric Co., Ltd., The: *See—*
Sasajima, Junnosuke; Nagai, Hiroshi; Mogi, Kenji; Nojiri, Akio; and Shiina, Naonori, 4,434,251, Cl. 521-75.000.
Furuse, Takao: *See—*
Sakuma, Isamu; Nishida, Katsuhiko; Kawano, Hideo; Ueno, Masayasu; Matsumoto, Yoshishige; Matsumoto, Shohei; and Furuse, Takao, 4,434,491, Cl. 372-48.000.
G. D Societa per Azioni: *See—*
Seragnoli, Enzo, 4,433,694, Cl. 131-92.000.
Gaglione, Stanley; and O'Hare, James A., to United States of America, Army. Phased array element with polarization control. 4,434,426, Cl. 343-372.000.
Galia, Karl. Metered quantity dispensing valve. 4,433,797, Cl. 222-207.000.
Gammill, Ronald B., to Upjohn Company, The. Anti-atherosclerotic 6,7-dihydro-7,7-disubstituted-khellin analogs. 4,434,295, Cl. 549-344.000.
Gammill, Ronald B., to Upjohn Company, The. Process for preparing intermediates for antiatherosclerotic compounds. 4,434,296, Cl. 549-471.000.
Gans, Michael J.; and Snell, William W., Jr., to Bell Telephone Laboratories, Incorporated. Multiple amplifier interconnection for optimal sensitivity. 4,434,405, Cl. 330-149.000.
Ganz, Robert H.; and Manizza, Guelfo A., to Federal Paper Board Co., Inc. Closure interlock for cartons of the wrap around type. 4,433,806, Cl. 229-40.000.
Ganz, Robert H., to Federal Paper Board Co., Inc. Carton closure interlock. 4,433,807, Cl. 229-40.000.
Gardner, Edward A.: *See—*
Rubinson, Barry L.; Parenti, Mark A.; Lary, Richard F.; and Gardner, Edward A., 4,434,487, Cl. 371-10.000.
Gareis, Ronald E., to General Electric Company. Controlled flux contactor. 4,434,450, Cl. 361-152.000.
Garito, Jon C.; and Ellman, Alan G. Extracoronal dental splint and splinting method. 4,433,960, Cl. 433-215.000.
Garrett Corporation, The: *See—*
Parker, Kenneth O., 4,433,723, Cl. 165-166.000.
Gartside, Robert J.; and Woebcke, Herman N., to Stone & Webster Engineering Corp. Low residence time solid-gas separation device and system. 4,433,984, Cl. 55-196.000.
Garzon, Ruben D., to Brown Boveri Electric, Inc. Liquid SF_6 interrupter with arc energy driven piston and contact. 4,434,336, Cl. 200-150.00G.
Gaughan, Edmund J.: *See—*
Mahoney, Martin D.; Gaughan, Edmund J.; Pallos, Ferenc M.; and Lam, Hsiao-Ling, 4,434,000, Cl. 71-103.000.
GCA Corporation: *See—*
Masters, Joseph I.; and Goldberg, Gershon M., 4,434,217, Cl. 430-9.000.
Gebert, Kenneth W.; and Rajski, Pat A., to Consolidated Papers, Inc. Edge dam for paper coating apparatus and method. 4,434,194, Cl. 427-356.000.
Gebrueder Buehler AG: *See—*
Borst, Williband, 4,433,986, Cl. 55-272.000.
Geiger, Diethard: *See—*
Eisermann, A.min; Eicken, Heinz T.; and Geiger, Diethard, 4,433,772, Cl. 194-59.000.
Geiger, Friedhelm: *See—*
Bach, Gerhard; Geiger, Friedhelm; Heimberger, Werner; Schreyer, Gerd; and Hillenbrand, Horst, 4,434,148, Cl. 423-379.000.
Gellert, Jobst U. Injection molding valve pin bushing and method. 4,433,969, Cl. 425-548.000.
General Clutch Corp.: *See—*
Rude, Edward T.; Nisenson, Jules; and Waine, Martin, 4,433,765, Cl. 192-41.00S.
General Dynamics, Pomona Division: *See—*
Hagelberg, Allen C.; and Allardt, Clark E., 4,433,606, Cl. 89-1.812.
General Electric Company: *See—*
Altmansberger, David C.; Huss, Christina L.; and Kroger, Haans H., 4,434,060, Cl. 210-724.000.
Baker, Lewin T.; Bose, Sanjay K.; and Huber, Paul G., 4,434,421, Cl. 340-825.510.
Dills, Raymond L., 4,434,344, Cl. 219-10.55E.
Fox, Daniel W.; Miller, George P.; and Weech, Marx E., 4,434,074, Cl. 252-628.000.
Gareis, Ronald E., 4,434,450, Cl. 361-152.000.
Interrante, Leonard V., 4,434,103, Cl. 260-448.00B.
Johnston, Richard P., 4,433,955, Cl. 415-1.000.
Koenig, Fredrick, 4,433,466, Cl. 29-564.600.
Nelson, Conrad E., 4,434,397, Cl. 324-58.00R.
Rosa, Hugh E.; and Slaterpryce, Allen A., 4,433,595, Cl. 74-813.00L.
Ryckman, William D., Jr., 4,433,741, Cl. 177-199.000.
Taylor, Carl D., 4,434,456, Cl. 362-374.000.
General Mining Union Corporation Limited: *See—*
Bohme, Rolf C.; and Lazerson, Max M., 4,434,365, Cl. 250-255.000.
General Motors Corporation: *See—*
Cornelius, Walter; Kosek, Thomas P.; and Klomp, Edward D., 4,433,540, Cl. 60-39.511.
Mantela, Ralph F., 4,434,124, Cl. 264-229.000.
Muench, Nils L., 4,433,953, Cl. 414-735.000.
Parker, Donald L.; and Hogg, Hubert, 4,433,872, Cl. 303-22.00A.
Perry, William H.; Stewart, David C.; and Waterworth, Geoffrey, 4,433,867, Cl. 296-146.000.
Roush, Roy W., Jr., 4,433,629, Cl. 105-222.000.
Schubring, Norman W., 4,434,342, Cl. 219-10.55M.
Shih, Kelvin; Pochert, Kurt A.; and Dunford, James M., 4,433,576, Cl. 73-204.000.
Sundeen, Arthur R., 4,433,572, Cl. 73-116.000.
Taylor, Edward F.; and O'Kane, James C., 4,433,858, Cl. 280-802.000.
Warwick, Edward H.; and Parker, Donald L., 4,433,757, Cl. 188-1.110.
Winger, James L., 4,433,888, Cl. 339-91.00R.
Genex Corporation: *See—*
Swann, Wayne E., 4,434,228, Cl. 435-108.000.
Geo. A. Hormel & Company: *See—*
Leining, Lyndon R.; and Simonson, Kent L., 4,433,453, Cl. 17-21.000.
George, Guerino F.: *See—*
Sellet, Frederick; George, Guerino F.; and Abbondante, Thomas S., 4,433,899, Cl. 350-307.000.
Geremia, Leo F., to Tri-tech, Inc. High temperature switch. 4,434,330, Cl. 200-67.0DA.
Gergely, John S.: *See—*
Correa, Aderbal C.; Gergely, John S.; and Blanchard, Andrew J., 4,434,364, Cl. 250-253.000.
Gerwick, Ben C., Jr.; and Hatcher, Stephen J., to Mobil Oil Corporation. Structure for offshore exploitation. 4,433,941, Cl. 405-211.000.
Geskin, Ernest S. Steel making method. 4,434,003, Cl. 75-24.000.
Giammarco, Giuseppe; and Giammarco, Paolo. Absorption of CO_2 and/or H_2S utilizing solutions containing two different activators. 4,434,144, Cl. 423-223.000.
Giammarco, Paolo: *See—*
Giammarco, Giuseppe; and Giammarco, Paolo, 4,434,144, Cl. 423-223.000.
Giani, Angel, to Deere & Company. Cylindrical baler with automatic steering system. 4,433,533, Cl. 56-341.000.
Gibbons, James F., to Sera Solar Corporation. Solar cells and method. 4,434,318, Cl. 136-258.000.
Gibilisco, Kenneth J., to Merck & Co., Inc. Convertible child resistant closure. 4,433,789, Cl. 215-220.000.
Gibson Associates, Inc.: *See—*
Gibson, Royal H., 4,433,790, Cl. 215-246.000.
Gibson, Royal H., to Gibson Associates, Inc. Tamper-proof closure. 4,433,790, Cl. 215-246.000.
Giebel, Gerhard: *See—*
Lichtner, Emil; Ungeringer, Gerd; and Giebel, Gerhard, 4,433,653, Cl. 123-193.00H.
Gilder, Timothy W.: *See—*
Whatton, Rodney; and Gilder, Timothy W., 4,433,813, Cl. 241-21.000.
Gilleland, Frank W., to Owens-Corning Fiberglas Corporation. Solar collector having resilient and adjustable mounting means. 4,433,674, Cl. 126-450.000.
Ginzburg, Vladimir B.: *See—*
Tippins, George W.; and Ginzburg, Vladimir B., 4,433,566, Cl. 72-229.000.

Giobbio, Vincenzo; Ornato, Giorgio; Buracchi, Livio; and Mangia, Alberto, to Pierrel S.p.A. Process for the removal of the formyl group from N-formyl peptides and esters thereof. 4,434,097, Cl. 260-112.50R.

Giorgini, Eugene A.; and Sullivan, John L., to Figgie International Inc. Pressure demand regulator with automatic shut-off. 4,433,685, Cl. 128-204.260.

Girgis, Mikhail M., to PPG Industries, Inc. Aqueous, adhesive coating composition with a non-self-crosslinkable elastomer for use with filamentary materials. 4,434,208, Cl. 428-378.000.

Girgis, Ramsis S.: *See*—
Bell, Clifford J.; and Girgis, Ramsis S., 4,434,448, Cl. 361-23.000.

Glaverbel: *See*—
Toussaint, Francois, 4,433,995, Cl. 65-135.000.

Glickman, Myron, to Mi-Jack Products, Inc. Tracked crane for large objects. 4,433,952, Cl. 414-460.000.

Godfrey, Thomas E., to Milliken Research Corporation. Flow controller. 4,433,811, Cl. 239-74.000.

Goedert, Ferdinand: *See*—
Metz, Paul; Schleimer, Francois; Goedert, Ferdinand; Henrion, Romain; Klein, Henri; and Liesch, Jean-Francois, 4,434,005, Cl. 75-60.000.

Goes In Center, Kate; and Schell, Francis J., to International Business Machines Corporation. Pivoting reference edge. 4,433,909, Cl. 355-75.000.

Gogniat, Paul; and Loth, Eric, to Montres Rado S.A. Watch crystal bonded to watch case with low temperature solder material. 4,433,921, Cl. 368-294.000.

Gold, Samuel; Tracton, Arthur A.; and Rosenski, Josephine M., to National Starch and Chemical Corporation. Base coatings for use on vacuum metallized paper. 4,434,259, Cl. 524-31.000.

Goldberg, Gershon M.: *See*—
Masters, Joseph I.; and Goldberg, Gershon M., 4,434,217, Cl. 430-9.000.

Goldstein, Norman P.; and Todt, William H., to Westinghouse Electric Corp. Self-powered radiation detector with improved emitter. 4,434,370, Cl. 250-370.000.

Goldwater, Sam: *See*—
Kleykamp, Gayheart C.; Goldwater, Sam; and Salsbery, Charles L., 4,434,436, Cl. 358-118.000.

Golem, Michael W., to UOP Inc. Multiple valve apparatus for simulated moving bed adsorption processes. 4,434,051, Cl. 210-264.000.

Gombos nee Visky, Zsuzsanna: *See*—
Lempert, Karoly; Harsanyi, Kalman; Doleschall, Gabor; Hornyak, Gyula; Nyitrai, Jozsef; Zauer, Karoly; Fetter, Jozsef; Simig, Gyula; Gombos nee Visky, Zsuzsanna; and Szalai nee Barta, Gizella, 4,434,099, Cl. 260-239.00A.

Gomi, Yoshiaki; Hirata, Takahiro; Takaoka, Michio; Mohtai, Tsuneaki; and Akashi, Kazuya, to Chuba Electric Power Company Inc., The; and Fujikura Cable Works, Ltd., The. POF Cable having outer pipe with carved offset sections to accommodate expansion of the core. 4,434,319, Cl. 174-13.000.

Goodman, Alvin M., to RCA Corporation. Method of forming a self aligned aluminum polycrystalline silicon line. 4,433,469, Cl. 29-571.000.

Goodyear Aerospace Corporation: *See*—
Crossman, Richard L., 4,433,758, Cl. 188-196.00R.
Robinson, Keith D.; and Smitley, George P., 4,434,021, Cl. 156-242.000.

Gordon, Donald W. Exercise structure and ball game. 4,433,838, Cl. 272-65.000.

Gordon, Robert L.; and Smith, John G., to International Paper Company. Pourable, recloseable lid. 4,433,808, Cl. 229-43.000.

Gordon, Scott E.: *See*—
Anderson, Philip M., III; Kearney, James E.; and Gordon, Scott E., 4,434,411, Cl. 335-208.000.

Gorling, Karl G.: *See*—
Edstrom, John O.; and Gorling, Karl G., 4,434,001, Cl. 75-3.000.

Goscenski, Edward J., Jr., to Eaton Corporation. Clutch-brake assembly. 4,433,764, Cl. 192-18.00R.

Gossmann, Willi: *See*—
Brandenstein, Manfred; Hans, Ruiger; Horling, Peter; Hetterich, Hermann; Pape, Gebhard; and Gossmann, Willi, 4,433,932, Cl. 403-261.000.

Gottlieb, Saul, to Gottlieb, Simon. Hot water heating system. 4,433,810, Cl. 237-8.00R.

Gottlieb, Simon: *See*—
Gottlieb, Saul, 4,433,810, Cl. 237-8.00R.

Graham, John F. Textile spinning machines. 4,433,538, Cl. 57-328.000.

Grebner, Kurt G. E.: *See*—
Drakenborn, Karl-Gunnar; Enser, Mats A.; Grebner, Kurt G. E.; and Wallmark, Erik I., 4,434,460, Cl. 364-200.000.

Green, Edward A., to Eaton Corporation. Remote control system. 4,433,591, Cl. 74-479.000.

Green, Jerome J., to Raytheon Company. Dielectric waveguide phase shifter. 4,434,409, Cl. 333-24.100.

Green, Philip S.; and Taenzer, Jon C., to Siemens AG. Compact ultrasound apparatus for medical examination. 4,433,690, Cl. 128-660.000.

Gregory, George D., to Challenger Caribbean Corporation; Challenger Products Corporation; and Commander Electrical Equipment, Inc. Support for current carrying member. 4,433,891, Cl. 339-217.00R.

Griffiths, George E. Cleaning waste from beneath machinery. 4,433,455, Cl. 19-107.000.

Grime, Thomas E., to Champion Spark Plug Company. Paint spray attachment. 4,433,812, Cl. 239-290.000.

Grimmer, George G.: *See*—
Raulins, George M.; and Grimmer, George G., 4,433,862, Cl. 285-350.000.

Grimstad, Ronald N., to Kohler Co. Flush valve attachment system. 4,433,446, Cl. 4-378.000.

Groke, Karl: *See*—
Jeretin, Stojan; Groke, Karl; and Musil, Horst E., 4,434,160, Cl. 424-180.000.

Grover, Mark D.; and Shaffer, Thomas C. Log raiser. 4,433,829, Cl. 254-131.000.

Gruber, William P.: *See*—
Bell, Lon E.; and Gruber, William P., 4,434,414, Cl. 337-102.000.

Gruest, Jacqueline: *See*—
Bisagni, Emile; Ducrocq, Claire; Rivalle, Christian; Tambourin, Pierre; Wendling, Francoise; Civier, Alain; Montagnier, Luc; Chermann, Jean-Claude; Gruest, Jacqueline; and Lidereau, Rosette, 4,434,290, Cl. 546-70.000.

Grumman Aerospace Corporation: *See*—
Mead, Albert R., 4,433,567, Cl. 72-342.000.

Gschwend, Heinz W., to Ciba-Geigy Corporation. 7(2-Thienyl)dibenz[-c,e]azepines. 4,434,100, Cl. 260-330.300.

GTE Laboratories, Inc.: *See*—
Sarin, Vinod K., 4,433,739, Cl. 175-410.000.
Sarin, Vinod K.; Penty, Robert A.; and Buljan, Sergej-Tomislav, 4,433,979, Cl. 51-307.000.

GTE Products Corporation: *See*—
Barbano, Normand, 4,434,425, Cl. 343-797.000.
Lowe, Gary E., 4,434,386, Cl. 313-331.000.

GTI Corporation: *See*—
Anderson, Gary W.; and Stake, Dennis G., 4,433,622, Cl. 101-40.000.

Gucwa, Paul R.: *See*—
Sydansk, Robert D.; and Gucwa, Paul R., 4,433,728, Cl. 166-270.000.

Guest, Philip Q., Jr.: *See*—
Caddick, Gary R.; and Guest, Philip Q., Jr., 4,434,468, Cl. 364-424.000.

Gulf Research & Development Company: *See*—
Swift, Harold E.; and Lunden, Richard W., 4,434,281, Cl. 526-119.000.

Gunter, Franz-Josef, to Walther & Cie. Aktiengesellschaft. Rescue system on high-rise buildings. 4,433,752, Cl. 182-82.000.

Gustafson, Inc.: *See*—
Risdal, Norton W., 4,433,587, Cl. 73-863.540.

Gusto Engineering B.V.: *See*—
Boon, Bart, 4,433,938, Cl. 405-166.000.

Gutleber, Frank S., to United States of America, Army. Interference cancelling system for a mobile subscriber access communications system. 4,434,505, Cl. 455-50.000.

Guttag, Karl M.; and Vanaken, Jerry R., to Texas Instruments Incorporated. Off-chip access for psuedo-microprogramming in microprocessor. 4,434,462, Cl. 364-200.000.

Habel, Georg: *See*—
Muller, Hans-Jurgen; Schmidt, Karl; Chattopadhayay, Asoke; Heidemanns, Rolf P.; Habel, Georg; and Wittman, Ortwin, 4,433,662, Cl. 123-438.000.

Hachiro, Nobuaki: *See*—
Takeuchi, Hiroo; Hachiro, Nobuaki; and Miyazaki, Yoshihisa, 4,433,614, Cl. 91-376.00R.

Hackman, Donald J.: *See*—
Caudy, Don W.; Hackman, Donald J.; Myers, John R.; and Hoffman, Robert T., 4,433,633, Cl. 114-54.000.

Haefner, John A.: *See*—
Wilgus, Herbert S.; and Haefner, John A., 4,434,226, Cl. 430-567.000.

Hagelberg, Allen C.; and Allardt, Clark E., to General Dynamics, Pomona Division. Tandem rocket launcher. 4,433,606, Cl. 89-1.812.

Hager & Elsasser GmbH: *See*—
Marquardt, Kurt, 4,434,057, Cl. 210-638.000.

Hagiwara, Taro, to Nissan Motor Co., Ltd. Structure for mounting functional parts on a closable member of a vehicle. 4,433,866, Cl. 296-76.000.

Halcon SD Group, Inc., The: *See*—
Pugach, Joseph, 4,434,240, Cl. 502-24.000.

Halder, Mathis; Widmer, Jakob; and De Vries, Jacob, to LGZ Landis & Gyr Zug AG. Circuit for supervising an electronic electricity meter. 4,434,400, Cl. 324-110.000.

Hale, Robert R.; and McDougal, Allan R., to United States of America, National Aeronautics and Space Administration. Solar energy modulator. 4,433,672, Cl. 126-419.000.

Hall, George R.; Hall, Robert J.; and Cookerly, Jack C., to Norlin Industries, Inc. Orchestral accompaniment techniques. 4,433,601, Cl. 84-1.030.

Hall, John B.; Sanders, James M.; and Siano, James N., to International Flavors & Fragrances Inc. Process for the production of isosolanone and solanone, intermediates useful in said process and organoleptic uses of said intermediates. 4,433,695, Cl. 131-276.000.

Hall, Mark N. Acoustic resonator having transducer pairs excited with phase-displaced energy. 4,433,916, Cl. 366-114.000.

Hall, Robert J.: *See*—
Hall, George R.; Hall, Robert J.; and Cookerly, Jack C., 4,433,601, Cl. 84-1.030.

Halliburton Company: *See*—
Chatterji, Jiten; Brake, Bobby G.; and Tinsley, John M., 4,433,731, Cl. 166-293.000.

Cox, Bruce M.; and Stephenson, Stanley V., 4,433,701, Cl. 137-101.190.

Hallock, Robert L. Split head fastener. 4,433,949, Cl. 411-477.000.

Hallstrom, Olof A., Jr. Combination internal combustion and steam engine. 4,433,548, Cl. 60-712.000.

Halocarbon Products Corporation: *See*—
Astrologes, Gary W., 4,434,297, Cl. 560-236.000.

Hamabe, Takeshi; Wada, Hidekazu; Naruse, Mikio; and Nishimori, Toshiyuki, to Matsushita Electric Industrial Co., Ltd. Metallized film capacitor. 4,434,452, Cl. 361-304.000.

Hamane, Tokuhito: *See*—
Kubota, Tadashi; Hamane, Tokuhito; and Tasai, Masaaki, 4,433,475, Cl. 29-736.000.

Hampson, Jeffrey D.; and Billington, Reginald, to Lever Brothers Company. Detergent compositions containing sulphosuccinate mixtures. 4,434,087, Cl. 252-545.000.

Hampson, Jeffrey D.; Billington, Reginald; and Cox, Ian R., to Lever Brothers Company. Detergent compositions containing sulphosuccinate mixtures. 4,434,090, Cl. 252-547.000.

Handelsbolaget Ohrnell-Teknik: *See*—
Ohrnell, Hakan; and Naslund, Leif, 4,433,586, Cl. 73-862.480.

Hanger, James E.; and Walker, Charles T., to Walker, Charles Tillman. Self-feeding apparatus and method. 4,433,950, Cl. 414-9.000.

Hans, Ruiger: *See*—
Brandenstein, Manfred; Hans, Ruiger; Horling, Peter; Hetterich, Hermann; Pape, Gebhard; and Gossmann, Willi, 4,433,932, Cl. 403-261.000.

Hanse, Joel G., to Honeywell Inc. Dual-polarization interferometer with a single-mode waveguide. 4,433,915, Cl. 356-350.000.

Hanson, Derald F.; and Sherman, Randy J., to Lincoln Laser Company. Method and apparatus for generating optical scans. 4,433,894, Cl. 350-6.800.

Harada, Hiroyoshi: *See*—
Kamada, Osao; Matsuga, Yoshiaki; Watase, Masami; Kudo, Tadato; Harada, Hiroyoshi; and Kanezaki, Atsushi, 4,434,022, Cl. 156-274.600.

Haramaki, Toshio; and Nakayama, Shigeru, to Tokyo Shibaura Denki Kabushiki Kaisha. Sheet and original feeding for image forming system. 4,433,905, Cl. 355-3.0SH.

Hardy-The McLain, Philippe: *See*—
Parsons, James H., Jr.; Hardy-The McLain, Philippe; and Tringali, Dominick, 4,433,933, Cl. 403-268.000.

Harmer, Alan L., to Battelle Memorial Institute. Refractive index of a liquid referred to a predetermined temperature. 4,433,913, Cl. 356-133.000.

Harnischfeger Corporation: *See*—
Melvin, Raymond C., 4,433,874, Cl. 305-53.000.

Harper Trucks, Inc.: *See*—
Rousseau, Kenneth E., 4,433,816, Cl. 242-129.620.

Harrington, J. Vincent. Method of tunnel construction employing submerged caisson. 4,433,937, Cl. 405-137.000.

Harris, Mack. Acid concentrating and recovery system. 4,434,026, Cl. 159-1.00S.

Harrison, David B., to Cook Stolowitz & Frame. Tethered submarine pressure transfer storage facility for liquified energy gases. 4,433,940, Cl. 405-210.000.

Harsanyi, Kalman: *See*—
Lempert, Karoly; Harsanyi, Kalman; Doleschall, Gabor; Hornyak, Gyula; Nyitrai, Jozsef; Zauer, Karoly; Fetter, Jozsef; Simig, Gyula; Gombos nee Visky, Zsuzsanna; and Szalai nee Barta, Gizella, 4,434,099, Cl. 260-239.00A.

Hartel, Gunter; Schurfeld, Armin; and Jordan, Wolfgang, to Bosch & Pierburg System oHG. Device for the speed-dependent closure limitation of a carburettor main throttle. 4,433,661, Cl. 123-339.000.

Hartman, Ludwig; Ruzek, Ivo; and Locher, Engelbert, to Carl Freudenberg, Firma. Spun-bonded fabric of partially drawn polypropylene with a low draping coefficient. 4,434,204, Cl. 428-198.000.

Hasegawa, Noboru: *See*—
Kozawa, Shigeyuki; Hasegawa, Noboru; and Kawahara, Hiroshi, 4,434,277, Cl. 525-507.000.

Haselton, Halsey H.: *See*—
Dagenhart, William K.; Haselton, Halsey H.; Stirling, William L.; and Whealton, John H., 4,434,131, Cl. 376-130.000.

Hashimoto, Nobuyuki; and Hattori, Takemi, to Aisin Seiki Kabushiki Kaisha. Air bag system. 4,433,708, Cl. 141-114.000.

Hastings, Paul D.: *See*—
Bolding, Charles N.; and Hastings, Paul D., 4,433,821, Cl. 248-65.000.

Hatcher, Stephen J.: *See*—
Gerwick, Ben C., Jr.; and Hatcher, Stephen J., 4,433,941, Cl. 405-211.000.

Hattori, Takemi: *See*—
Hashimoto, Nobuyuki; and Hattori, Takemi, 4,433,708, Cl. 141-114.000.

Hattori, Yoshiyuki; Matsui, Kazuma; and Kinbara, Hiroji, to Nippondenso Co., Ltd. Torque transmission belt means. 4,433,965, Cl. 474-201.000.

Hauser, Herbert J., Jr., to Deere & Company. Piston assembly for an internal combustion engine. 4,433,616, Cl. 92-190.000.

Hayn, John W.: *See*—
McDonough, Kevin C.; Hayn, John W.; and Bellay, Jeffrey D., 4,434,465, Cl. 364-200.000.

Haynes, Gardner S.: *See*—
Baboian, Robert; and Haynes, Gardner S., 4,434,039, Cl. 204-196.000.

Hazeltine Corporation: *See*—
Kenol, Claude J.; and DeGeorge, Richard M., 4,434,422, Cl. 343-5.0SC.

Healey, Daniel J., III; and Morrison, Steven, to Westinghouse Electric Corp. Presetting circuit for the voltage-controlled oscillator of a phase lock loop. 4,434,407, Cl. 331-4.000.

Hebert, Francis A., to South Louisiana Contractors. Apparatus for reclaiming nailed boards from a board road. 4,433,464, Cl. 29-252.000.

Heibel, Helmut: *See*—
Thomas, Alfred W.; and Heibel, Helmut, 4,433,543, Cl. 60-547.100.

Heidemanns, Rolf P.: *See*—
Muller, Hans-Jurgen; Schmidt, Karl; Chattopadhayay, Asoke; Heidemanns, Rolf P.; Habel, Georg; and Wittman, Ortwin, 4,433,662, Cl. 123-438.000.

Heimberger, Werner: *See*—
Bach, Gerhard; Geiger, Friedhelm; Heimberger, Werner; Schreyer, Gerd; and Hillenbrand, Horst, 4,434,148, Cl. 423-379.000.

Heinemann, Ulrich; Thomas, Rudolf; Lantzsch, Reinhard; Ditgens, Klaus; and Weber, Erhard, to Bayer Aktiengesellschaft. Process for the preparation of pyrazole. 4,434,292, Cl. 548-373.000.

Heinisch, Peter: *See*—
von der Eltz, Hans-Ulrich; Heinisch, Peter; and Ballmann, Hans J., 4,433,976, Cl. 8-555.000.

Heiss, John F.: *See*—
Chandler, William S.; Wilkens, Walter F.; and Heiss, John F., 4,434,187, Cl. 426-652.000.

Heitlinger, Paul: *See*—
Lemke, Norbert, 4,434,500, Cl. 378-99.000.

Hemmat, Naim, to Electric Power Research Institute, Inc. Amorphous magnetic core and process for manufacturing to improve efficiency. 4,433,474, Cl. 29-605.000.

Henges, J. Gordon, Jr.; and Schulte, Steve W., to J Henges Enterprises, Inc. Ceiling system for small buildings. 4,433,514, Cl. 52-94.000.

Henke, Steven J.: *See*—
Holtzberg, Matthew W.; Henke, Steven J.; and Spaulding, Lawrence D., 4,433,964, Cl. 474-152.000.

Henrion, Romain: *See*—
Metz, Paul; Schleimer, Francois; Goedert, Ferdinand; Henrion, Romain; Klein, Henri; and Liesch, Jean-Francois, 4,434,005, Cl. 75-60.000.

Hensley, Albert L., Jr.; Nevitt, Thomas D.; and Tait, A. Martin, to Standard Oil Company (Indiana). Catalytic dewaxing-hydrotreating process. 4,434,047, Cl. 208-111.000.

Herbert, William J.: *See*—
Klein, Gary S.; and Herbert, William J., 4,434,320, Cl. 174-23.00R.

Hercules Incorporated: *See*—
Maslanka, William W.; and Spence, Gavin G., 4,434,267, Cl. 524-458.000.

Herman Miller, Inc.: *See*—
Edwards, Thomas M.; Kelley, James O.; and Beard, Michael D., 4,433,884, Cl. 312-256.000.

Herman, Richard J.: *See*—
Driver, Gary R.; and Herman, Richard J., 4,433,859, Cl. 285-34.000.

Herve, Robert: *See*—
Michel, Ugon; and Herve, Robert, 4,434,473, Cl. 364-900.000.

Herwig, Warren E.; Kaminski, Tony L.; and Shupert, Paul T., to Allis-Chalmers Corporation. Torsion spring coupled drive mechanism for reciprocating device having hazard warning means. 4,433,529, Cl. 56-10.200.

Herz, Claus: *See*—
Eichler, Jurgen; Herz, Claus; and Neisius, Karl-Heinz, 4,434,035, Cl. 204-159.130.

Hetterich, Hermann: *See*—
Brandenstein, Manfred; Hans, Ruiger; Horling, Peter; Hetterich, Hermann; Pape, Gebhard; and Gossmann, Willi, 4,433,932, Cl. 403-261.000.

Heuer, Horst: *See*—
Horlbeck, Gernot; and Heuer, Horst, 4,434,276, Cl. 525-437.000.

Hicks, William T.; and Seidel, William C., to Du Pont de Nemours, E. I., and Company. Base metal conductor cathode coating for tantalum capacitors. 4,434,084, Cl. 252-512.000.

Hideyuki, Noma: *See*—
Katumi, Horiko; and Hideyuki, Noma, 4,434,123, Cl. 264-225.000.

Highfield, William, to Fuel Systems Management. Carburetor, control apparatus and method for internal combustion engines. 4,434,110, Cl. 261-36.00A.

Higuchi, Masayuki, to Sharp Kabushiki Kaisha. Solar cell power supply circuit. 4,434,395, Cl. 320-1.000.

Hildinger, Eugen, deceased (by Hildinger, Marianne, heir), to Siemens Aktiengesellschaft. Text processing device. 4,434,471, Cl. 364-900.000.

Hildinger, Marianne, heir: *See*—
Hildinger, Eugen, deceased, 4,434,471, Cl. 364-900.000.

Hill, Bernhard: *See*—
Sander, Ingolf; and Hill, Bernhard, 4,434,477, Cl. 365-120.000.

Hill, Ira D.; Trenkle, Robert W.; Mookherjee, Braja D.; and Wolff, Robin K., to International Flavors & Fragrances, Inc. Process for augmenting or enhancing the fresh air aroma of clothing. 4,434,086, Cl. 252-522.00R.

Hill, Ronald L., to FMC Corporation. Wheel clamping nut with freely rotating insert. 4,433,578, Cl. 73-487.000.

Hillenbrand, Horst: *See*—
Bach, Gerhard; Geiger, Friedhelm; Heimberger, Werner; Schreyer, Gerd; and Hillenbrand, Horst, 4,434,148, Cl. 423-379.000.
Hillstrom, David U.: *See*—
Main, Keith A.; and Hillstrom, David U., 4,433,935, Cl. 403-385.000.
Hinchliffe, Richard H. Helmet adapted for use by hay fever sufferers. 4,433,988, Cl. 55-357.000.
Hingorani, Narain G., to Electric Power Research Institute, Inc. Method and means for damping subsynchronous oscillations and DC offset in an AC power system. 4,434,376, Cl. 307-102.000.
Hirabayashi, Tsugio: *See*—
Ikemoto, Isao; Koiso, Junichi; Tamura, Akihiko; and Hirabayashi, Tsugio, 4,433,904, Cl. 355-3.0DD.
Hiraga, Masaharu: *See*—
Fukushima, Eiji; Fukuhara, Seiichi; and Hiraga, Masaharu, 4,433,564, Cl. 72-146.000.
Hiraoka, Yasunobu: *See*—
Izutsu, Tadashi; Koutake, Masanobu; Hiraoka, Yasunobu; Takafuji, Shin-ichi; Yamada, Tamotsu; Kurosawa, Seiji; and Satoh, Tetsuo, 4,433,618, Cl. 99-455.000.
Hirata, Takahiro: *See*—
Gomi, Yoshiaki; Hirata, Takahiro; Takaoka, Michio; Mohtai, Tsuneaki; and Akashi, Kazuya, 4,434,319, Cl. 174-13.000.
Hisaki, Tomoko: *See*—
Yoshikawa, Akira; Takeda, Akitsu; Ochi, Osamu; Hisaki, Tomoko; and Mizushima, Yoshihiko, 4,434,224, Cl. 430-323.000.
Hitachi Cable Limited: *See*—
Kamada, Osao; Matsuga, Yoshiaki; Watase, Masami; Kudo, Tadato; Harada, Hiroyoshi; and Kanezaki, Atsushi, 4,434,022, Cl. 156-274.600.
Hitachi, Ltd.: *See*—
Amano, Matsuo; Teranishi, Takao; Mouri, Yasunori; Abe, Osamu; and Sasayama, Takao, 4,433,650, Cl. 123-179.00G.
Fujimura, Takashi; and Takahashi, Katsuyu, 4,433,994, Cl. 65-110.000.
Imahori, Seiichi; Kaneko, Masaharu; Ozawa, Tetsuo; Imazeki, Shuji; Mukoh, Akio; and Sato, Mikio, 4,434,072, Cl. 252-299.100.
Ishikawa, Isao; Kanda, Miroshi; and Kondo, Toshio, 4,433,461, Cl. 29-25.350.
Natsui, Ken-ichi; and Koyanagi, Osamu, 4,434,335, Cl. 200-148.00E.
Suzuki, Hitoshi; Takahashi, Shigekatsu; and Fujioka, Yoshiki, 4,434,464, Cl. 364-200.000.
Terao, Motoyasu; Horigome, Shinkichi; Mitsuya, Munehisa; Ota, Sakae; and Shigematsu, Kazuo, 4,434,429, Cl. 346-135.100.
Hobart Brothers Company: *See*—
Reid, Gary L., 4,434,348, Cl. 219-61.000.
Hochstein, Peter A. Method and assembly for monitoring respiration and detecting apnea. 4,433,693, Cl. 128-721.000.
Hochwitz, Lynn E.; Schaefer, Daniel W.; and Dawson, Michael L., to Simplicity Manufacturing, Inc. Cab for walk-behind tractor. 4,433,868, Cl. 296-190.000.
Hodgson, Robert A.; and Martinez, Sam J., to Maloney-Crawford Corporation. Calcium chloride dehydration nozzle. 4,433,983, Cl. 55-171.000.
Hoechst AG: *See*—
von der Eltz, Hans-Ulrich; Heinisch, Peter; and Ballmann, Hans J., 4,433,976, Cl. 8-555.000.
Hoelderich, Wolfgang; Mross, Wolf D.; and Schwarzmann, Matthias, to BASF Aktiengesellschaft. Preparation of olefins from methanol/-dimethyl ether. 4,434,314, Cl. 585-640.000.
Hoeren, Gerd H.: *See*—
Palmquist, Steven R.; Chapman, David D.; and Hoeren, Gerd H., 4,434,488, Cl. 371-15.000.
Hoerschelmann, Konstantin; Kausche, Helmold; and Spath, Werner, to Siemens Aktiengesellschaft. Method and apparatus for doping semiconductor material. 4,434,036, Cl. 204-164.000.
Hoffman, Robert T.: *See*—
Caudy, Don W.; Hackman, Donald J.; Myers, John R.; and Hoffman, Robert T., 4,433,633, Cl. 114-54.000.
Hoffman, Ronald R.: *See*—
Payne, Rex E., Jr.; and Hoffman, Ronald R., 4,433,869, Cl. 297-5.000.
Hoffmann-La Roche Inc.: *See*—
Bohnen, Klaus, 4,434,165, Cl. 424-248.400.
Cohen, Noal; and Weber, Giuseppe, 4,434,101, Cl. 260-410.90R.
Hostettler, Hans U.; and Pauling, Horst, 4,434,178, Cl. 424-287.000.
Hofmann, Karlheinz: *See*—
Pietzsch, Herbert; Lachner, Walter; Hofmann, Karlheinz; Potzsch, Erich; and Esser, Fred, 4,434,494, Cl. 373-18.000.
Hogg, Hubert: *See*—
Parker, Donald L.; and Hogg, Hubert, 4,433,872, Cl. 303-22.00A.
Holaday, John W.; and Faden, Alan I., to United States of America, Army. Narcotic antagonists in the therapy of shock. 4,434,168, Cl. 424-260.000.
Hold-A-Fold, Inc.: *See*—
Blaas, Wolfgang; Bergl, Friedrich; and Wetmore, Judson D., 4,434,020, Cl. 156-216.000.
Holland, Charles J.; Wallach, Steven; and Alsing, Carl J., to Data General Corporation. Data processing system having instruction responsive apparatus for both a basic and an extended instruction set. 4,434,459, Cl. 364-200.000.
Hollaway, Gerald C., Jr., to Dayco Corporation. Method of making a polymeric strip and a power transmission belt. 4,434,019, Cl. 156-137.000.
Hollowell, Barry S., to Mayfran, Inc. Pusher assembly for scrap metal conveyors. 4,433,775, Cl. 198-742.000.
Holmes, Marvin: *See*—
Wells, Ivan D.; Koh, Jin L.; and Holmes, Marvin, 4,433,544, Cl. 60-641.120.
Holtvoigt, Werner: *See*—
Beck, Heinz; Holtvoigt, Werner; and Mukerjee, Ambar, 4,434,260, Cl. 524-104.000.
Holtzberg, Matthew W.; and Spaulding, Lawrence D., to Standard Oil Company. Composite valve and process. 4,433,652, Cl. 123-188.0AA.
Holtzberg, Matthew W.; Henke, Steven J.; and Spaulding, Lawrence D., to Standard Oil Company. Composite timing gears and process. 4,433,964, Cl. 474-152.000.
Hon Corporation: *See*—
Hon, David T., 4,433,852, Cl. 280-278.000.
Hon, David T., to Hon Corporation. Foldable and portable vehicle. 4,433,852, Cl. 280-278.000.
Honda Giken Kogyo Kabushiki Kaisha: *See*—
Amano, Katsuhisa; Kumagai, Tadashi; Masaki, Akio; Shimada, Shinichi; Suzuki, Takeshi; and Ohtaka, Shoichi, 4,433,541, Cl. 60-293.000.
Miyakoshi, Shinichi; and Isono, Tokio, 4,433,850, Cl. 280-277.000.
Miyakoshi, Shinichi; and Isono, Tokio, 4,433,851, Cl. 280-277.000.
Ohmori, Taiji; Kasahara, Toshio; and Uchida, Yoshiaki, 4,433,743, Cl. 180-41.000.
Ohmori, Taiji, 4,433,849, Cl. 280-6.00R.
Honda, Mitsuo: *See*—
Katagiri, Kiyoo; and Honda, Mitsuo, 4,433,510, Cl. 51-165.00R.
Honeywell Inc.: *See*—
Bickman, Bernard F., 4,433,691, Cl. 128-660.000.
Coffel, Jerome F., 4,433,818, Cl. 244-3.130.
Hanse, Joel G., 4,433,915, Cl. 356-350.000.
Koepke, Barry G.; and McHenry, Kelly D., 4,433,980, Cl. 51-308.000.
Quinn, Thomas G., III, 4,433,924, Cl. 374-2.000.
Wilwerding, Dennis J., 4,434,362, Cl. 250-201.000.
Honeywell Information Systems Italia: *See*—
Cavallari, Pier G., 4,433,927, Cl. 400-124.000.
Hongo, Chikara: *See*—
Chibata, Ichiro; Yamada, Shigeki; Hongo, Chikara; and Yoshioka, Ryuzo, 4,434,107, Cl. 260-501.120.
Honkanen, George P.: *See*—
Burke, Roger M.; DeSatnick, Allen H.; and Honkanen, George P., 4,433,687, Cl. 128-318.000.
Hoobler, Mary A.: *See*—
Sikorski, James A.; and Hoobler, Mary A., 4,433,996, Cl. 71-087.000.
Hooker, Donald E.; and Tojza, Roman A., to Bally Manufacturing Corporation. Drive mechanism for a variable speed gaming device. 4,433,844, Cl. 273-143.00R.
Hoover, Stephen V.: *See*—
Kuhlmann, George E.; and Hoover, Stephen V., 4,434,244, Cl. 502-209.000.
Hoppe, David R., to Motorola Inc. Differential time interpolator. 4,433,919, Cl. 368-120.000.
Horigome, Shinkichi: *See*—
Terao, Motoyasu; Horigome, Shinkichi; Mitsuya, Munehisa; Ota, Sakae; and Shigematsu, Kazuo, 4,434,429, Cl. 346-135.100.
Horike, Masanori; and Ebi, Yutaka, to Ricoh Company, Ltd. Deflection detector for ink jet printing apparatus. 4,434,428, Cl. 346-75.000.
Horlbeck, Gernot; and Heuer, Horst, to Chemische Werke Huels Aktiengesellschaft. Process for the condensation of poly(alkylene terephthalates). 4,434,276, Cl. 525-437.000.
Horling, Peter: *See*—
Brandenstein, Manfred; Hans, Ruiger; Horling, Peter; Hetterich, Hermann; Pape, Gebhard; and Gossmann, Willi, 4,433,932, Cl. 403-261.000.
Horn, Walter, to Fissler Gesellschaft mit beschrankter Haftung. Pressure indicator. 4,433,579, Cl. 73-715.000.
Hornbuckle, John A.: *See*—
Thomas, Robert C.; Hornbuckle, John A.; and Fatka, Richard J., 4,434,470, Cl. 364-565.000.
Hornyak, Gyula: *See*—
Lempert, Karoly; Harsanyi, Kalman; Doleschall, Gabor; Hornyak, Gyula; Nyitrai, Jozsef; Zauer, Karoly; Fetter, Jozsef; Simig, Gyula; Gombos nee Visky, Zsuzsanna; and Szalai nee Barta, Gizella, 4,434,099, Cl. 260-239.00A.
Horowitz, Harold S.: *See*—
Horowitz, Hugh H.; Horowitz, Harold S.; and Longo, John M., 4,434,031, Cl. 204-59.00R.
Horowitz, Hugh H.; Horowitz, Harold S.; and Longo, John M., to Exxon Research and Engineering Co. Method of electrocatalytic oxidation of organic compounds. 4,434,031, Cl. 204-59.00R.
Horvath, Tibor; Udvardy, Agnes; David, Agoston; and Marmarosi nee Kellner, Katalin, to CHINOIN Gyogyszer es Vegyeszeti Termekek Gyara Rt. Time-release. 4,434,152, Cl. 424-19.000.
Hoshino Gakki Co., Ltd.: *See*—
Matsui, Kazuhiro, 4,433,605, Cl. 84-299.000.
Hostettler, Hans U.; and Pauling, Horst, to Hoffmann-La Roche, Inc. Antiperspirants. 4,434,178, Cl. 424-287.000.
Hu, Shih-Ming: *See*—
Bhattacharya, Somnath; Hu, Shih-Ming; Koopman, Nicholas G.; and Oldakowski, Chester C., 4,434,434, Cl. 357-71.000.

Huang, Helen: *See—*
Oswald, Alexis A.; Huang, Helen; Huang, John; and Valint, Paul, Jr., 4,434,062, Cl. 252-8.55D.
Huang, John: *See—*
Oswald, Alexis A.; Huang, Helen; Huang, John; and Valint, Paul, Jr., 4,434,062, Cl. 252-8.55D.
Huang, Victor T.: *See—*
Desia, Nitin; Delaney, Rory A. M.; Brouwer, Peter; and Huang, Victor T., 4,434,186, Cl. 426-565.000.
Huber, Paul G.: *See—*
Baker, Lewin T.; Bose, Sanjay K.; and Huber, Paul G., 4,434,421, Cl. 340-825.510.
Hubred, Gale L.; and Van Leirsburg, Dean A., to Chevron Research Company. Stripping a solution containing molybdenum and vanadium values. 4,434,140, Cl. 423-54.000.
Hubred, Gale L.; and Van Leirsburg, Dean A., to Chevron Research Company. Recovery of cobalt, molybdenum, nickel and vanadium from an aqueous ammonia and ammonium salt solution by coextracting molybdenum and vanadium and sequential extraction of nickel and cobalt. 4,434,141, Cl. 423-54.000.
Huckabay, John A., to Imperial West Chemical Company. Method for treatment of aluminum dross oxides. 4,434,142, Cl. 423-111.000.
Huffman, Charles E.; and Southerland, Stephen R., to Rockwell International Corporation. Drop and insert channel bank with reduced channel units. 4,434,485, Cl. 370-55.000.
Hughes Aircraft Company: *See—*
Knauer, Wolfgang, 4,434,371, Cl. 250-396.00R.
Hughes, Thomas R.: *See—*
Buss, Waldeen C.; and Hughes, Thomas R., 4,434,311, Cl. 585-444.000.
Hughes Tool Company: *See—*
Regan, Albert M., 4,433,939, Cl. 405-195.000.
Hulin, Jean-Pierre, to Schlumberger Technical Corporation. Method and apparatus for determining the flow characteristics of a fluid in a well. 4,433,573, Cl. 73-155.000.
Hummel, Donald A. Compact dual bell section trombone case. 4,433,781, Cl. 206-314.000.
Humphreys, Bryan E., to T.K.S. (Aircraft De-Icing) Limited. Porous panel. 4,434,201, Cl. 428-137.000.
Hunter Investment Company: *See—*
Smith, Harris W., 4,433,645, Cl. 122-136.00R.
Hurwitz, Marvin J.: *See—*
Fellman, Robert P.; Hurwitz, Marvin J.; Myers, Robert M.; and Slack, Gerald F., 4,433,958, Cl. 433-199.000.
Huss, Christina L.: *See—*
Altmansberger, David C.; Huss, Christina L.; and Kroger, Haams H., 4,434,060, Cl. 210-724.000.
Husson, Alan L.: *See—*
Caputo, William R.; and Husson, Alan L., 4,433,756, Cl. 187-29.00R.
Hydro-Quebec: *See—*
Pelletier, Jean-Marc; and Dion, Yvon, 4,434,413, Cl. 337-71.000.
Hyzak, Daniel L., to Stauffer Chemical Company. Herbicide compositions containing soil life extenders and antidotes. 4,433,999, Cl. 71-100.000.
Iacoviello, Steven A.: *See—*
Kaczur, Jerry J.; Iacoviello, Steven A.; and Miller, Edward G., 4,434,033, Cl. 204-95.000.
Icaro Olivieri & C. S.p.A.: *See—*
Olivieri, Icaro, 4,433,458, Cl. 24-191.000.
Ichinose, Hisao, to Nissan Motor Co. Ltd. Gas spring. 4,433,759, Cl. 188-282.000.
ICI Australia Limited: *See—*
Smith, Lindsay K.; and Yabsley, Michael A., 4,434,017, Cl. 149-2.000.
Igashira, Toshihiko: *See—*
Abe, Seiko; Igashira, Toshihiko; Kawai, Hisasi; Ina, Toshikazu; and Tokoro, Masayoshi, 4,433,665, Cl. 123-552.000.
Iijima, Takashi: *See—*
Nankai, Shiro; Nakamura, Ken-ichi; and Iijima, Takashi, 4,434,229, Cl. 435-174.000.
Iizuka, Syogo: *See—*
Suzuki, Yoshitsugu; Iizuka, Syogo; Kajiyama, Shigeo; Usui, Kenji; and Kobayashi, Masahiro, 4,433,479, Cl. 29-825.000.
Ikeda, Chihiro, to Takeda Machinery Works Company, Ltd. Workpiece locating device for a corner shear machine. 4,433,600, Cl. 83-468.000.
Ikeda, Hiroki: *See—*
Arakawa, Takeshi; and Ikeda, Hiroki, 4,434,502, Cl. 382-41.000.
Ikeda, Hisao: *See—*
Tsuchiya, Shuji; Ikeda, Hisao; and Suzuki, Kenji, 4,434,104, Cl. 260-456.00P.
Ikeda, Tokuzo: *See—*
Fujii, Shigeo; Ikeda, Tokuzo; Mikami, Takashi; and Okano, Shuji, 4,434,205, Cl. 428-218.000.
Ikemoto, Isao; Koiso, Junichi; Tamura, Akihiko; and Hirabayashi, Tsugio, to Konishiroku Photo Industry Co., Ltd. Electrophotographic copying machine. 4,433,904, Cl. 355-3.0DD.
Ikemoto, Kazuhito; Katayama, Nobuaki; Terakura, Yukio; and Sasaki, Kan, to Toyota Jidosha Kogyo Kabushiki Kaisha. Gear-teeth protector in change-speed gearing units. 4,433,593, Cl. 74-606.00R.
Imahori, Seiichi; Kaneko, Masaharu; Ozawa, Tetsuo; Imazeki, Shuji; Mukoh, Akio; and Sato, Mikio, to Mitsubishi Chemical Industries, Ltd.; and Hitachi Ltd. Liquid crystal composition. 4,434,072, Cl. 252-299.100.
Imai, Iwao: *See—*
Ishikawa, Yasuki; Endo, Hiroshi; Sone, Masazumi; and Imai, Iwao, 4,433,669, Cl. 123-620.000.
Imazeki, Shuji: *See—*
Imahori, Seiichi; Kaneko, Masaharu; Ozawa, Tetsuo; Imazeki, Shuji; Mukoh, Akio; and Sato, Mikio, 4,434,072, Cl. 252-299.100.
Imbert, Thierry: *See—*
Dostert, Philippe; Imbert, Thierry; and Bucher, Bernard, 4,434,170, Cl. 424-265.000.
Imperial Chemical Industries PLC: *See—*
Doroszkowsky, Andrew; and Pavey, Victor J., 4,434,268, Cl. 524-520.000.
Imperial West Chemical Company: *See—*
Huckabay, John A., 4,434,142, Cl. 423-111.000.
Ina, Toshikazu: *See—*
Abe, Seiko; Igashira, Toshihiko; Kawai, Hisasi; Ina, Toshikazu; and Tokoro, Masayoshi, 4,433,665, Cl. 123-552.000.
Inagaki, Sanji; Takiguchi, Shinji; and Tanaka, Susumu, to Minolta Camera Kabushiki Kaisha. Offset prevention layer for heat roller fixing device. 4,434,355, Cl. 219-216.000.
Independent Systems Corporation: *See—*
Mellon, Timothy; and Carlson, Gustaf B., 4,433,712, Cl. 160-122.000.
Index-Werke Komm.-Ges. Hahn & Tessky: *See—*
Baumgartner, Richard, 4,433,488, Cl. 33-185.00R.
Inductive Control Systems B.V.: *See—*
Ruumpol, Geurt J., 4,434,412, Cl. 336-134.000.
Industria Macchine Automatiche: *See—*
Romagnoli, Andrea, 4,433,798, Cl. 222-255.000.
Ing. C. Olivetti & C., S.p.A.: *See—*
Boggio, Giuseppe; and Lorenzi, Mario, 4,434,324, Cl. 178-69.00R.
Ingemann, Ole, to A/S Haustrup Plastic. Container having frangible opening means. 4,433,793, Cl. 220-276.000.
Inland Enterprises, Inc.: *See—*
Butts, Douglas E., 4,433,832, Cl. 266-87.000.
Innovative Research: *See—*
Smith, Jerry R., 4,433,854, Cl. 280-511.000.
Inoguchi, Kazuhiro; Nakanishi, Tomohiko; and Asano, Mitsuru, to Nippon Soken, Inc. Method for producing a cordierite body. 4,434,117, Cl. 264-56.000.
Inoue, Takeo: *See—*
Nagano, Toshio; Kobayashi, Toshiyuki; Koshirakawa, Nobutaka; and Inoue, Takeo, 4,433,724, Cl. 166-60.000.
Insituform International, Inc.: *See—*
Chick, Douglas K., 4,434,115, Cl. 264-36.000.
Institut Francais du Petrole: *See—*
Juguin, Bernard; and Miquel, Jean, 4,434,315, Cl. 585-671.000.
Layotte, Pierre-Claude; and Bozec, Laurent, 4,433,736, Cl. 173-94.000.
Rojey, Alexandre; and Cheron, Jacques, 4,433,554, Cl. 62-112.000.
Institute Organicheskogo Sinteza: *See—*
Chipens, Gunar I.; Veretennikova, Nadezhda I.; and Atare, Zeltite A., 4,434,095, Cl. 260-112.50R.
Institute Po Physikochimia: *See—*
Vitkova, Stefana D.; and Mircheva, Vera V., 4,434,030, Cl. 204-43.00T.
International Business Machines Corporation: *See—*
Abbott, Jerry J.; Crossan, Stephen C.; Fuller, Sterritt R., Jr.; and Jachimiak, Paul D., 4,434,220, Cl. 430-108.000.
Barner, Robert P., Jr.; Bensadon, Joseph M.; Besseyre, Jacques A.; and Markey, Harold G., 4,434,486, Cl. 370-110.100.
Bhattacharya, Somnath; Hu, Shih-Ming; Koopman, Nicholas G.; and Oldakowski, Chester C., 4,434,434, Cl. 357-71.000.
Cook, Herbert C.; and Troutman, Ronald R., 4,434,478, Cl. 365-185.000.
Craig, Timothy P.; Pettit, John W.; and Timperman, Michael R., 4,434,356, Cl. 219-216.000.
Dailey, Jack R.; Kuntzleman, Harry C.; Ng, Charles S.; and Pike, John W., 4,434,432, Cl. 346-154.000.
Darrow, Russell E.; Funari, Joseph; Kotrch, George S.; and Phillips, George C., 4,434,134, Cl. 419-5.000.
Drakenborn, Karl-Gunnar; Enser, Mats A.; Grebner, Kurt G. E.; and Wallmark, Erik I., 4,434,460, Cl. 364-200.000.
Franey, Terence E., 4,434,207, Cl. 428-343.000.
Goes In Center, Kate; and Schell, Francis J., 4,433,909, Cl. 355-75.000.
McCaskill, Rex A.; McInroy, John W.; and Waldo, Paul D., 4,434,475, Cl. 364-900.000.
International Computers Limited: *See—*
Betts, Dennis J., 4,434,321, Cl. 174-68.500.
International Flavors & Fragrances Inc.: *See—*
Evers, William J.; Mookherjee, Braja D.; Van Ouwerkerk, Anton; and Van Loveren, Augustinus G., 4,434,085, Cl. 252-522.00R.
Hall, John B.; Sanders, James M.; and Siano, James N., 4,433,695, Cl. 131-276.000.
Hill, Ira D.; Trenkle, Robert W.; Mookherjee, Braja D.; and Wolff, Robin K., 4,434,086, Cl. 252-522.00R.
International Harvester Co.: *See—*
Kesl, Elmer M.; Scarnato, Thomas J.; and Sammarco, Peter, 4,433,531, Cl. 56-106.000.
Prokop, Josef F.; Coons, Robert R.; and Mylander, Richard H., 4,433,762, Cl. 192-4.00A.
International Paper Company: *See—*
Gordon, Robert L.; and Smith, John G., 4,433,808, Cl. 229-43.000.

Mendel, Jack M.; Bomgardner, Carl C.; Rack, Robert W.; Scott, Donald G.; and Stritmater, August W., 4,433,917, Cl. 366-132.000.
International Precision Incorporated: *See*—
Yonezawa, Akira, 4,434,367, Cl. 250-311.000.
International Shoe Machine Corporation: *See*—
Becka, Michael M.; and Bennett, George, 4,433,632, Cl. 112-262.300.
International Standard Elektric Corporation: *See*—
Kautz, Werner, 4,434,423, Cl. 343-406.000.
International Telephone and Telegraph Corporation: *See*—
Caddick, Gary R.; and Guest, Philip Q., Jr., 4,434,468, Cl. 364-424.000.
Interrante, Leonard V., to General Electric Company. Substituted silicon-oxygen-aluminum oligomers and preparation thereof. 4,434,103, Cl. 260-448.00B.
Inventio AG: *See*—
Friedli, Paul; and Suss, Hans G., 4,434,466, Cl. 364-200.000.
Irresberger, Hermann, to Bergwerksverband GmbH. Method and apparatus for controlling a mine roof support. 4,433,945, Cl. 405-302.000.
Ishida, Hiroshi: *See*—
Kobari, Katsuo; Ishida, Hiroshi; and Ota, Naoto, 4,434,393, Cl. 318-757.000.
Ishikawa, Isao; Kanda, Miroshi; and Kondo, Toshio, to Hitachi, Ltd. Method of manufacturing an acoustic spherical lens. 4,433,461, Cl. 29-25.350.
Ishikawa, Yasuki; Endo, Hiroshi; Sone, Masazumi; and Imai, Iwao, to Nissan Motor Company, Limited. Plasma ignition system for an internal combustion engine. 4,433,669, Cl. 123-620.000.
Ishikawajima-Harima Jukogyo Kabushiki Kaisha: *See*—
Tomizawa, Fumio; and Aoshika, Masayuki, 4,434,495, Cl. 373-76.000.
Ishimoto, Akio: *See*—
Kanamori, Kozo; Ishimoto, Akio; Konishi, Masaaki; Maita, Hitoshi; and Shimoyama, Hiroshi, 4,434,023, Cl. 156-307.300.
Ishizaki, Hiroyuki; Tsujino, Yoshiki; and Dohi, Masaji, to Fujitsu Limited. Method for driving a charge injection device. 4,434,441, Cl. 358-213.000.
Isobe, Minoru; Kikuchi, Hiroshi; Teshima, Minoru; Kodama, Tadasi; and Iwama, Mitsuo, to Oki Electric Industry Co., Ltd.; and Nippon Telegraph & Telephone Public Corporation. Printer head. 4,433,926, Cl. 400-124.000.
Isolite Babcock Refractories Co., Ltd.: *See*—
Kato, Takeo, 4,433,480, Cl. 29-432.000.
Isono, Tokio: *See*—
Miyakoshi, Shinichi; and Isono, Tokio, 4,433,850, Cl. 280-277.000.
Miyakoshi, Shinichi; and Isono, Tokio, 4,433,851, Cl. 280-277.000.
Isover Saint-Gobain: *See*—
Debouzie, Alain; Sainte-Foi, Daniel; and Blandin, Yannick, 4,433,992, Cl. 65-3.100.
Itek Corporation: *See*—
Fay, Victor K., 4,434,404, Cl. 330-85.000.
Ito, Keizo: *See*—
Tsukamoto, Goro; Kohno, Toshihiko; Yoshino, Koichiro; Morita, Tominori; Ito, Keizo; and Nose, Takashi, 4,434,162, Cl. 424-200.000.
Ito, Kenji: *See*—
Sugita, Hiroshi; Tsuda, Yasuo; Ito, Kenji; and Shimba, Satoru, 4,434,225, Cl. 430-544.000.
Ito, Michiaki: *See*—
Tatsumi, Hisao; and Ito, Michiaki, 4,433,592, Cl. 74-573.00F.
Itou, Takaaki: *See*—
Teramura, Mitsuyoshi; Takimoto, Masatami; Nakamura, Norihiko; Itou, Takaaki; Katou, Takashi; Yasuda, Takeru; and Kitamura, Sunao, 4,434,111, Cl. 261-44.00C.
Ivasyuk, Boris N.: *See*—
Spongr, Jerry J.; Tiebor, John E.; and Ivasyuk, Boris N., 4,434,366, Cl. 250-308.000.
Iwakura, Ryoji: *See*—
Sekiya, Fukuo; Morokawa, Shigeru; and Iwakura, Ryoji, 4,433,920, Cl. 368-201.000.
Iwama, Mitsuo: *See*—
Isobe, Minoru; Kikuchi, Hiroshi; Teshima, Minoru; Kodama, Tadasi; and Iwama, Mitsuo, 4,433,926, Cl. 400-124.000.
Iwata, Yoshiko, to Kabushiki Kaisha Audio-Technica. Stabilizer for record discs. 4,434,484, Cl. 369-271.000.
Izutsu, Tadashi; Koutake, Masanobu; Hiraoka, Yasunobu; Takafuji, Shin-ichi; Yamada, Tamotsu; Kurosawa, Seiji; and Satoh, Tetsuo, to Snow Brand Milk Products Co., Ltd. Apparatus for continuously manufacturing fibrous high protein foods. 4,433,618, Cl. 99-455.000.
J Henges Enterprises, Inc.: *See*—
Henges, J. Gordon, Jr.; and Schulte, Steve W., 4,433,514, Cl. 52-94.000.
Jablonski, Dane E., to B. F. Goodrich Company, The. Vulcanizable compositions of halogen and carboxyl containing acrylate elastomers, 2,5-dimercapto-1,3,4-thiadiazole, a Group IVA metal oxide or salt and a tetraalkyl thiuram sulfide. 4,434,274, Cl. 525-349.000.
Jachimiak, Paul D.: *See*—
Abbott, Jerry J.; Crossan, Stephen C.; Fuller, Sterritt R., Jr.; and Jachimiak, Paul D., 4,434,220, Cl. 430-108.000.
Jacob, Eberhard: *See*—
Bacher, Walter; and Jacob, Eberhard, 4,434,139, Cl. 423-19.000.
Jacobs, Fritz E.: *See*—
Vernon, Lonnie W.; and Jacobs, Fritz E., 4,434,045, Cl. 208-107.000.
Jaecklin, Alexander P.: *See*—
Schmid, Alfred, Jr.; Muller, Hans; and Jaecklin, Alexander P., 4,433,779, Cl. 206-220.000.
JAFF Investment Company: *See*—
Faunce, Frank R., 4,433,959, Cl. 433-201.000.
Jarosz, John M.; and Panas, William R., to S&C Electric Company. Electrical control module for a current-limiting fuse. 4,434,415, Cl. 337-186.000.
Jatkar, Arun D.: *See*—
Joshi, Ashok V.; Jatkar, Arun D.; and Sholette, William P., 4,434,216, Cl. 429-191.000.
Jede-Automater Magnusson AB: *See*—
Magnusson, Jan, 4,433,617, Cl. 99-305.000.
Jeglinski, Werner: *See*—
Flisikowski, Peter; Jeglinski, Werner; and Jelmorini, Gerardus, 4,434,350, Cl. 219-121.0LC.
Jelmorini, Gerardus: *See*—
Flisikowski, Peter; Jeglinski, Werner; and Jelmorini, Gerardus, 4,434,350, Cl. 219-121.0LC.
Jendruach, Paul, to E.C.H. Will (GmbH & Co.). Apparatus for manipulating stacks of paper sheets or the like. 4,433,773, Cl. 198-467.000.
Jenkins, Henry H. Panel mounted vacuum control valve. 4,433,703, Cl. 137-541.000.
Jenkins, Thomas A. Simulated log construction element. 4,433,519, Cl. 52-233.000.
Jeretin, Stojan; Groke, Karl; and Musil, Horst E., to Leopold & Co. Chem. Pharm. Fabrik Gesellschaft m.b.H. Nutrient solution for complete parenteral feeding and for increased energy production. 4,434,160, Cl. 424-180.000.
Johnson, Dennis P.: *See*—
Niles, Aaron F.; and Johnson, Dennis P., 4,434,213, Cl. 429-3.000.
Johnson, Donald A.; and Nimry, Baker N. Polymers for prevention of fouling by iron oxides in cooling systems. 4,434,059, Cl. 210-701.000.
Johnson & Johnson Products, Inc.: *See*—
Yoon, Hee K., 4,433,680, Cl. 128-90.000.
Johnston, Richard P., to General Electric Company. Turbine arrangement. 4,433,955, Cl. 415-1.000.
Jones, John L.; and Rubino, Andrew M., to Armour Pharmaceutical Company. Basic aluminum bromide compositions and methods useful as astringents or anti-perspirants. 4,434,155, Cl. 424-47.000.
Jones, Keith: *See*—
Cox, Ian R.; and Jones, Keith, 4,434,091, Cl. 252-557.000.
Jones, Larren F.; and Earll, Jeffrey P., to ESCO Corporation. Locking device for excavating equipment. 4,433,496, Cl. 37-141.00R.
Jones, Peter D. Recyclable paper binding means. 4,433,929, Cl. 402-14.000.
Jones, Richard E., III: *See*—
Mauldin, Donald M.; and Jones, Richard E., III, 4,433,679, Cl. 128-80.00F.
Joosten, Michael W., to Conoco Inc. Damping device for use with acoustic information generation machines. 4,433,582, Cl. 73-788.000.
Jordan, Wolfgang: *See*—
Hartel, Gunter; Schurfeld, Armin; and Jordan, Wolfgang, 4,433,661, Cl. 123-339.000.
Joshi, Ashok V.; Jatkar, Arun D.; and Sholette, William P., to Rayovac Corporation. Solid state electrolyte. 4,434,216, Cl. 429-191.000.
Joy Manufacturing Company: *See*—
Densmore, Neal W., 4,433,777, Cl. 198-834.000.
Juguin, Bernard; and Miquel, Jean, to Institut Francais du Petrole. Process for isomerizing olefins. 4,434,315, Cl. 585-671.000.
Jung, Gerard, to Rhone-Poulenc Industries. Means for embedding microorganisms in a polymer matrix. 4,434,231, Cl. 435-253.000.
Justice, David D.: *See*—
Kelly, Pilar P.; and Justice, David D., 4,434,041, Cl. 204-296.000.
Jwuc, Karl J., to Midland-Ross Corporation. Composite cushion pad. 4,433,834, Cl. 267-141.100.
Kabushiki Kaisha Audio-Technica: *See*—
Iwata, Yoshiko, 4,434,484, Cl. 369-271.000.
Kabushiki Kaisha GEMV AC: *See*—
Sakuma, Shinzo; Yanagisawa, Hifumi; Tokuhata, Kazuo; and Miyagawa, Hiroshi, 4,434,331, Cl. 200-144.00B.
Kabushiki Kaisha Komatsu Seisakusho: *See*—
Kiyosawa, Hiroshi, 4,433,620, Cl. 100-43.000.
Kodama, Kazuo, 4,433,948, Cl. 407-42.000.
Kabushiki Kaisha Meidensha: *See*—
Sakuma, Shinzo; Yanagisawa, Hifumi; Tokuhata, Kazuo; and Miyagawa, Hiroshi, 4,434,331, Cl. 200-144.00B.
Kabushiki Kaisha Suwa Seikosha: *See*—
Fujiwara, Hitoshi; and Matsuzawa, Masanao, 4,433,925, Cl. 400-88.000.
Koto, Haruhiko, 4,434,430, Cl. 346-140.00R.
Kabushiki Kaisha Tokai Rika Denki Seisakusho: *See*—
Tsuchiya, Takaoki, 4,433,562, Cl. 70-186.000.
Kabushiki Kaisha Wako: *See*—
Kondo, Kazuyoshi, 4,433,568, Cl. 72-356.000.
Kachun, Lee, to Falco Data Products. General purpose data terminal system with display line refreshing and keyboard scanning using pulsewidth modulation. 4,434,472, Cl. 364-900.000.
Kaczur, Jerry J.; Iacoviello, Steven A.; and Miller, Edward G., to Olin Corporation. Process for producing concentrated solutions containing alkali metal chlorates and alkali metal chlorides. 4,434,033, Cl. 204-95.000.
Kageyama, Hachiro; Moriuchi, Tsutomu; and Oikawa, Yoshiaki, to Kyodo Yushi Co., Ltd. Lubricant compositions. 4,434,063, Cl. 252-25.000.

Kai, Tomokazu: *See*—
Fujiwara, Ryuhei; Kai, Tomokazu; and Nakahara, Hidetoshi, 4,434,506, Cl. 455-53.000.

Kaieda, Shozo: *See*—
Tanaka, Atsuyuki; Kojima, Hiroaki; Kaieda, Shozo; Kakiuchi, Tokuji; Nishioka, Nobuaki; Tadauchi, Yukio; and Nakagami, Hidekazu, 4,434,503, Cl. 382-48.000.

Kaji, Hisatsugu: *See*—
Fukuda, Hiroyuki; Kaji, Hisatsugu; and Fujimaki, Hiroto, 4,434,206, Cl. 428-288.000.

Kajiyama, Shigeo: *See*—
Suzuki, Yoshitsugu; Iizuka, Syogo; Kajiyama, Shigeo; Usui, Kenji; and Kobayashi, Masahiro, 4,433,479, Cl. 29-825.000.

Kakiuchi, Tokuji: *See*—
Tanaka, Atsuyuki; Kojima, Hiroaki; Kaieda, Shozo; Kakiuchi, Tokuji; Nishioka, Nobuaki; Tadauchi, Yukio; and Nakagami, Hidekazu, 4,434,503, Cl. 382-48.000.

Kakizaki, Syozo: *See*—
Sasaki, Tohru; Ohta, Mitsuru; Terasaki, Syuuzi; and Kakizaki, Syozo, 4,434,209, Cl. 428-416.000.

Kaldor, Shmuel: *See*—
Yarnitsky, Yashaya; and Kaldor, Shmuel, 4,433,794, Cl. 221-224.000.

Kamada, Osao; Matsuga, Yoshiaki; Watase, Masami; Kudo, Tadato; Harada, Hiroyoshi; and Kanezaki, Atsushi, to Hitachi Cable Limited. Process for manufacturing copper-clad laminate. 4,434,022, Cl. 156-274.600.

Kameyama, Shuichi; Kanzaki, Koichi; and Sasaki, Yoshitaka, to Tokyo Shibaura Denki Kabushiki Kaisha. Method for manufacturing semiconductor device utilizing selective etching and diffusion. 4,433,470, Cl. 29-577.00C.

Kaminski, Tony L.: *See*—
Herwig, Warren E.; Kaminski, Tony L.; and Shupert, Paul T., 4,433,529, Cl. 56-10.200.

Kamo, Mutsukazu; Matsumoto, Seiichiro; Sato, Yoichiro; and Setaka, Nobuo, to National Institute for Researches in Inorganic Materials. Method for synthesizing diamond. 4,434,188, Cl. 427-39.000.

Kampf, Wolfgang, to Chemische Werke Huels Aktiengesellschaft. Process for the isomerization of isolated double bonds to conjugated double bonds in optionally substituted cyclooctadienes. 4,434,310, Cl. 585-377.000.

Kanamori, Kozo; Ishimoto, Akio; Konishi, Masaaki; Maita, Hitoshi; and Shimoyama, Hiroshi, to Sekisui Kagaku Kogyo Kabushiki Kaisha. Method for producing plate heater. 4,434,023, Cl. 156-307.300.

Kanda, Miroshi: *See*—
Ishikawa, Isao; Kanda, Miroshi; and Kondo, Toshio, 4,433,461, Cl. 29-25.350.

Kanebo, Ltd.: *See*—
Tsukamoto, Goro; Kohno, Toshihiko; Yoshino, Koichiro; Morita, Tominori; Ito, Keizo; and Nose, Takashi, 4,434,162, Cl. 424-200.000.

Kaneko, Masaharu: *See*—
Imahori, Seiichi; Kaneko, Masaharu; Ozawa, Tetsuo; Imazeki, Shuji; Mukoh, Akio; and Sato, Mikio, 4,434,072, Cl. 252-299.100.

Kaneko, Thomas M., to BASF Wyandotte Corporation. Liquefied normally solid polyoxyalkylene copolymers. 4,434,077, Cl. 252-357.000.

Kaneko, Thomas M., to BASF Wyandotte Corporation. Liquefied normally solid polyoxyalkylene copolymers. 4,434,078, Cl. 252-357.000.

Kanezaki, Atsushi: *See*—
Kamada, Osao; Matsuga, Yoshiaki; Watase, Masami; Kudo, Tadato; Harada, Hiroyoshi; and Kanezaki, Atsushi, 4,434,022, Cl. 156-274.600.

Kanno, Akira, to Aiwa Co., Ltd. Soldering method for electric and or electronic components. 4,433,805, Cl. 228-180.00R.

Kanzaki, Koichi: *See*—
Kameyama, Shuichi; Kanzaki, Koichi; and Sasaki, Yoshitaka, 4,433,470, Cl. 29-577.00C.

Kaplan, Paul M.: *See*—
Zolton, Raymond P.; Kaplan, Paul M.; and Padvelskis, John V., 4,434,093, Cl. 260-112.00B.

Karga, James D.; and McCullough, Harold E., to Bell Telephone Laboratories, Incorporated. Keying block extracting tool. 4,433,477, Cl. 29-764.000.

Karl Mengele & Sohne: *See*—
Frick, Georg; Reiff, Harro; and Kirsch, Alois, 4,433,467, Cl. 29-565.000.

Karuhn, Richard F.: *See*—
Berg, Robert H.; and Karuhn, Richard F., 4,434,398, Cl. 324-71.400.

Kasahara, Toshio: *See*—
Ohmori, Taiji; Kasahara, Toshio; and Uchida, Yoshiaki, 4,433,743, Cl. 180-41.000.

Kasui, Toshikatsu: *See*—
Takahashi, Yosuke; Akasaka, Hideki; Kasui, Toshikatsu; Niwa, Tatsuo; and Sukegawa, Tsuneo, 4,433,901, Cl. 350-357.000.

Katagiri, Kiyoo; and Honda, Mitsuo, to Shin-Etsu Engineering Co., Ltd.; and Naoetsu Electronics Co., Ltd. Method for controlling thickness of wafer-like work pieces under lapping and a lapping machine therefor. 4,433,510, Cl. 51-165.00R.

Katanaga, Kenji: *See*—
Nakano, Koji; and Katanaga, Kenji, 4,433,465, Cl. 29-415.000.

Kataoka, Hiroyuki: *See*—
Ohkubo, Tetsuo; Arai, Yoshio; and Kataoka, Hiroyuki, 4,434,431, Cl. 346-154.000.

Katayama, Nobuaki: *See*—
Ikemoto, Kazuhito; Katayama, Nobuaki; Terakura, Yukio; and Sasaki, Kan, 4,433,593, Cl. 74-606.00R.

Kates, James M., to Teledyne Industries, Inc. Tone arm pick up system. 4,434,482, Cl. 369-230.000.

Kato, Takeo, to Isolite Babcock Refractories Co., Ltd. Method of installing ceramic fiber blocks. 4,433,480, Cl. 29-432.000.

Kato, Tetsuo; Abeyama, Shozo; Kimura, Atsuyoshi; Sekiya, Shigenobu; and Nakamura, Sadayuki, to Daido Tokushuko Kabushiki Kaisha. Free cutting steel containing controlled inclusions and the method of making the same. 4,434,006, Cl. 75-123.00R.

Katou, Takashi: *See*—
Teramura, Mitsuyoshi; Takimoto, Masatami; Nakamura, Norihiko; Itou, Takaaki; Katou, Takashi; Yasuda, Takeru; and Kitamura, Sunao, 4,434,111, Cl. 261-44.00C.

Katumi, Horiko; and Hideyuki, Noma, to Shin-Etsu Polymer Co., Ltd. Method for the preparation of an electric connector. 4,434,123, Cl. 264-225.000.

Kausche, Helmold: *See*—
Hoerschelmann, Konstantin; Kausche, Helmold; and Spath, Werner, 4,434,036, Cl. 204-164.000.

Kautz, Werner, to International Standard Elektric Corporation. Doppler VOR. 4,434,423, Cl. 343-406.000.

Kavaya, Michael J.; and Menzies, Robert T., to United States of America, National Aeronautics and Space Administration. Spectrophone stabilized laser with line center offset frequency control. 4,434,490, Cl. 372-20.000.

Kawaguchi, Yoshio: *See*—
Nakata, Shuji; Kawaguchi, Yoshio; and Nishimura, Akira, 4,434,351, Cl. 219-117.100.

Kawahara, Hiroshi: *See*—
Kozawa, Shigeyuki; Hasegawa, Noboru; and Kawahara, Hiroshi, 4,434,277, Cl. 525-507.000.

Kawai, Hisasi: *See*—
Abe, Seiko; Igashira, Toshihiko; Kawai, Hisasi; Ina, Toshikazu; and Tokoro, Masayoshi, 4,433,665, Cl. 123-552.000.

Kawamata, Ikuo, to Nippon Electric Co., Ltd. Method for making semiconductor device having improved thermal stress characteristics. 4,433,468, Cl. 29-571.000.

Kawano, Hideo: *See*—
Sakuma, Isamu; Nishida, Katsuhiko; Kawano, Hideo; Ueno, Masayasu; Matsumoto, Yoshishige; Matsumoto, Shohei; and Furuse, Takao, 4,434,491, Cl. 372-48.000.

Kawasaki, Takao; Osaka, Yoshiaki; Komatsu, Katsumi; Yamaguchi, Yukiharu; and Ono, Saichi, to Kureha Kagaku Kogyo Kabushiki Kaisha. 2-Substituted-phenyl-5-alkylthiazolidine-4-one. 4,434,172, Cl. 424-270.000.

Kawasaki, Yutaka, to Tokyo Shibaura Denki Kabushiki Kaisha. Circuit breaker device. 4,434,333, Cl. 200-144.0AP.

Kazahaya, Masahiro, to Fischer & Porter Company. Auxiliary channel for direct digital control system. 4,434,458, Cl. 364-138.000.

Kearney, James E.: *See*—
Anderson, Philip M., III; Kearney, James E.; and Gordon, Scott E., 4,434,411, Cl. 335-208.000.

Keefer, Bowie G. Multi-cylinder reverse osmosis apparatus and method. 4,434,056, Cl. 210-637.000.

Keene, Frederick R., Jr.: *See*—
Eckert, Robert J.; and Keene, Frederick R., Jr., 4,434,012, Cl. 134-25.400.

Keith, Douglas L., to Leland Stanford Junior University, The Board of Trustees of the. Planar magnetron sputtering apparatus. 4,434,042, Cl. 204-298.000.

Kelley, James O.: *See*—
Edwards, Thomas M.; Kelley, James O.; and Beard, Michael D., 4,433,884, Cl. 312-256.000.

Kellogg, Walter J.; Scott, Arden L.; and Seneadza, Samuel K., to Westinghouse Electric Corp. Circuit for controlling multiple rated motors. 4,434,394, Cl. 318-771.000.

Kelly, Larry L. Blind. 4,433,713, Cl. 160-166.00R.

Kelly, Pilar P.; and Justice, David D., to Olin Corporation. Method for conditioning carboxylate/sulfonate composite membranes for producing KOH. 4,434,041, Cl. 204-296.000.

Kemeny, George A., to Westinghouse Electric Corp. Switch for very large DC currents. 4,433,607, Cl. 89-8.000.

Kenol, Claude J.; and DeGeorge, Richard M., to Hazeltine Corporation. Digital scan converter with randomized decay function. 4,434,422, Cl. 343-5.0SC.

Keogh, Michael J., to Union Carbide Corporation. Water-curable, silane modified alkyl acrylate copolymers and a process for the preparation thereof. 4,434,272, Cl. 525-100.000.

Kern, Roger J. Contact detector. 4,434,346, Cl. 219-69.00C.

Kernforschungszentrum Karlsruhe GmbH: *See*—
Bacher, Walter; and Jacob, Eberhard, 4,434,139, Cl. 423-19.000.

Kesl, Elmer M.; Scarnato, Thomas J.; and Sammarco, Peter, to International Harvester Co. Forage harvester corn snapping header. 4,433,531, Cl. 56-106.000.

Kessler, Erich, to Akzo N.V. Porous tubing. 4,434,250, Cl. 521-64.000.

Keszei, Jeno; Varga, Laszlo; and Donath, Jeno, to Bor, Mubor es Cipoipari. Measurement of the dimensions of footwear lasts. 4,433,485, Cl. 33-3.00R.

Key, Anthony N.: *See*—
Rollins, Kay; Key, Anthony N.; and Arlotte, Thomas F., 4,433,745, Cl. 180-118.000.

Kharrazi, N. Michael. Yogurt spread resembling cream cheese. 4,434,184, Cl. 426-40.000.

Khurgin, Boris; Rosinek, Shlomo; and Rinkewich, Isaac. Apparatus for metering liquid flow. 4,433,577, Cl. 73-290.00V.
Kidde, Inc.: *See*—
Mentzer, William R.; and Bernabe, Vincent, Jr., 4,433,515, Cl. 52-115.000.
Kikuchi, Hiroshi: *See*—
Isobe, Minoru; Kikuchi, Hiroshi; Teshima, Minoru; Kodama, Tadasi; and Iwama, Mitsuo, 4,433,926, Cl. 400-124.000.
Kim, Bill S.; and Ban, Jung J. Multiple choice tossing game. 4,433,841, Cl. 273-338.000.
Kim, Sung-Soon: *See*—
Oswera, Miroslav S.; Brooks, Ralf M.; and Kim, Sung-Soon, 4,433,902, Cl. 354-10.000.
Kim, Yung J.: *See*—
Preston, Dan C., Jr.; and Kim, Yung J., 4,433,726, Cl. 166-118.000.
Kimura, Atsuyoshi: *See*—
Kato, Tetsuo; Abeyama, Shozo; Kimura, Atsuyoshi; Sekiya, Shigenobu; and Nakamura, Sadayuki, 4,434,006, Cl. 75-123.00R.
Kinbara, Hiroji: *See*—
Hattori, Yoshiyuki; Matsui, Kazuma; and Kinbara, Hiroji, 4,433,965, Cl. 474-201.000.
King-Seeley Thermos Co.: *See*—
Spinner, Joseph R., 4,433,559, Cl. 62-354.000.
Kingsford, Ted I., to Plough, Inc. Adjustable cosmetic wiper. 4,433,928, Cl. 401-122.000.
Kirchanski, Stefan J.: *See*—
Azad, A. R. M.; Kirchanski, Stefan J.; and Brown, Michael C., 4,434,150, Cl. 424-1.100.
Kirk, William H. Flow meter. 4,433,583, Cl. 73-861.330.
Kirsch, Alois: *See*—
Frick, Georg; Reiff, Harro; and Kirsch, Alois, 4,433,467, Cl. 29-565.000.
Kishi, Mitsuhiro. Digger with supporting base pivotable on transversible member. 4,433,495, Cl. 37-103.000.
Kitamura, Sunao: *See*—
Teramura, Mitsuyoshi; Takimoto, Masatami; Nakamura, Norihiko; Itou, Takaaki; Katou, Takashi; Yasuda, Takeru; and Kitamura, Sunao, 4,434,111, Cl. 261-44.00C.
Kiyosawa, Hiroshi, to Kabushiki Kaisha Komatsu Seisakusho. Hydropneumatic control system for a wheeled, self-propelled bolster for the transportation of a die assembly into and out of a press. 4,433,620, Cl. 100-43.000.
Kjelgaard, Tom, to Tetra Pak International AB. Arrangement on packing containers. 4,433,784, Cl. 206-617.000.
Klein, Gary S.; and Herbert, William J., to Eaton Corporation. Contractible conduit sealing connector. 4,434,320, Cl. 174-23.00R.
Klein, Henri: *See*—
Metz, Paul; Schleimer, Francois; Goedert, Ferdinand; Henrion, Romain; Klein, Henri; and Liesch, Jean-Francois, 4,434,005, Cl. 75-60.000.
Klein, Schanzlin & Becker Aktiengesellschaft: *See*—
Dernedde, Robert; and Koch, Jurgen, 4,433,825, Cl. 248-672.000.
Kratzer, Adolf; and Dunnebier, Horst, 4,433,947, Cl. 406-99.000.
Kleinschmit, Peter; Voll, Manfred; and Engel, Richard, to Degussa Aktiengesellschaft. Gas black burner. 4,434,135, Cl. 422-150.000.
Kleykamp, Gayheart C.; Goldwater, Sam; and Salsbery, Charles L., to Merrill, Bruce. Addressable premium channel obfuscation device for cable television systems. 4,434,436, Cl. 358-118.000.
Kline, Sherman S.: *See*—
Witten, Franklyn H.; and Kline, Sherman S., 4,433,881, Cl. 312-107.500.
Klockner-Humboldt-Deutz Aktiengesellschaft: *See*—
Lichtner, Emil; Ungeringer, Gerd; and Giebel, Gerhard, 4,433,653, Cl. 123-193.00H.
Klomp, Edward D.: *See*—
Cornelius, Walter; Kosek, Thomas P.; and Klomp, Edward D., 4,433,540, Cl. 60-39.511.
Kloss, Henry E. Process for making envelope for projection television tube. 4,433,962, Cl. 445-6.000.
Knauer, Wolfgang, to Hughes Aircraft Company. Electron beam blanking apparatus and method. 4,434,371, Cl. 250-396.00R.
Ko, Wen-Chuang; and Berry, Robert L., to Fairchild Camera & Instrument Corporation. Method for the formation of high density memory cells using ion implantation techniques. 4,433,471, Cl. 29-578.000.
Kobari, Katsuo; Ishida, Hiroshi; and Ota, Naoto, to Fujitsu Fanuc Limited. Induction motor control system. 4,434,393, Cl. 318-757.000.
Kobayashi, Kozo; and Minamishima, Mamoru, to Nakamichi Corporation. Volume control for an audio apparatus. 4,434,325, Cl. 381-104.000.
Kobayashi, Masahiro: *See*—
Suzuki, Yoshitsugu; Iizuka, Syogo; Kajiyama, Shigeo; Usui, Kenji; and Kobayashi, Masahiro, 4,433,479, Cl. 29-825.000.
Kobayashi, Shinsaku; and Ogiso, Akira, to Sankyo Company, Limited. Wound-healing promoters. 4,434,179, Cl. 424-308.000.
Kobayashi, Toshiyuki: *See*—
Nagano, Toshio; Kobayashi, Toshiyuki; Koshirakawa, Nobutaka; and Inoue, Takeo, 4,433,724, Cl. 166-60.000.
Kobayashi, Toyohiko; and Tsuruta, Haruki, to Takasago Perfumery Co., Ltd. Perfume composition. 4,434,306, Cl. 568-820.000.
Koch, George R.; and Petersen, Carl T., III, to Lam Research Corporation. Modular loadlock. 4,433,951, Cl. 414-217.000.
Koch, Jurgen: *See*—
Dernedde, Robert; and Koch, Jurgen, 4,433,825, Cl. 248-672.000.
Kodama, Kazuo, to Kabushiki Kaisha Komatsu Seisakusho. Cutter for a crankshaft milling machine. 4,433,948, Cl. 407-42.000.
Kodama, Tadasi: *See*—
Isobe, Minoru; Kikuchi, Hiroshi; Teshima, Minoru; Kodama, Tadasi; and Iwama, Mitsuo, 4,433,926, Cl. 400-124.000.
Koeck, Klaus; Bambach, Wolfgang; Ruopp, Gerhard; and Mikley, Frank, to Licentia Patent-Verwaltungs-GmbH. Circuit arrangement for establishing and terminating a data connection. 4,434,326, Cl. 179-2.0DP.
Koenig, Fredrick, to General Electric Company. Apparatus for making and using slot closure wedges at a coil injection station. 4,433,466, Cl. 29-564.600.
Koepke, Barry G.; and McHenry, Kelly D., to Honeywell Inc. Method of polishing silica base ceramics. 4,433,980, Cl. 51-308.000.
Koerner, Gotz: *See*—
Dumm, Heinz; Koerner, Gotz; Krakenberg, Manfred; Rott, Hans; and Schmidt, Gunter, 4,434,008, Cl. 106-271.000.
Koh, Jin L.: *See*—
Wells, Ivan D.; Koh, Jin L.; and Holmes, Marvin, 4,433,544, Cl. 60-641.120.
Kohira, Takeo; Taguchi, Takao; Sugiura, Takeo; and Ohta, Takatoshi, to Toppan Printing Co., Ltd.; and Okamoto Chemical Industry Co., Ltd. Image-forming element having an aluminum layer on a transparent film base. 4,434,223, Cl. 430-273.000.
Kohler Co.: *See*—
Grimstad, Ronald N., 4,433,446, Cl. 4-378.000.
Kohno, Toshihiko: *See*—
Tsukamoto, Goro; Kohno, Toshihiko; Yoshino, Koichiro; Morita, Tominori; Ito, Keizo; and Nose, Takashi, 4,434,162, Cl. 424-200.000.
Koiso, Junichi: *See*—
Ikemoto, Isao; Koiso, Junichi; Tamura, Akihiko; and Hirabayashi, Tsugio, 4,433,904, Cl. 355-3.0DD.
Kojima, Hiroaki: *See*—
Tanaka, Atsuyuki; Kojima, Hiroaki; Kaieda, Shozo; Kakiuchi, Tokuji; Nishioka, Nobuaki; Tadauchi, Yukio; and Nakagami, Hidekazu, 4,434,503, Cl. 382-48.000.
Kojima, Masaaki; Suzuki, Takayuki; and Abe, Hiromichi, to Nippon Kogaku K.K. Lens supporting assembly. 4,433,897, Cl. 350-252.000.
Kojima, Shigezo: *See*—
Okada, Tokio; Kojima, Shigezo; Tani, Haruhisa; Kurihara, Kazuhiko; and Yazawa, Hirosi, 4,434,128, Cl. 264-560.000.
Kokiso, Masakazu: *See*—
Tarumi, Noriyoshi; Tamura, Akihiko; and Kokiso, Masakazu, 4,434,218, Cl. 430-96.000.
Kokoszka, Joseph M.; and Tommasini, Rocco M., to United Technologies Corp. Total pressure probe. 4,433,584, Cl. 73-861.660.
Kolb, Gunter: *See*—
Probst, Joachim; Kolb, Gunter; Mummenhoff, Peter; and Baumgen, Heinz, 4,434,269, Cl. 524-538.000.
Koll, Eugene A., to Champion International Corporation. Round top rimming machine. 4,433,968, Cl. 425-392.000.
Kollmorgen Technologies Corporation: *See*—
Langley, Lawrence W.; and Bross, Roger B., 4,434,389, Cl. 318-254.000.
Kolts, John H., to Phillips Petroleum Company. Conversion and/or selectivity of a zinc titanate catalyst. 4,434,079, Cl. 252-412.000.
Komatsu, Katsumi: *See*—
Kawasaki, Takao; Osaka, Yoshiaki; Komatsu, Katsumi; Yamaguchi, Yukiharu; and Ono, Saichi, 4,434,172, Cl. 424-270.000.
Komenou, Kazunari: *See*—
Matsuda, Kazuo; Ohashi, Makoto; Satoh, Yoshio; Miyashita, Tsutomu; and Komenou, Kazunari, 4,434,476, Cl. 365-12.000.
Kommoss, Klaus; and Schutte, Heinz, to U.S. Philips Corporation. Automatic reverse system for tape recorder. 4,434,442, Cl. 360-74.200.
Kondo, Kazuyoshi, to Kabushiki Kaisha Wako. Precision closed-die forging method. 4,433,568, Cl. 72-356.000.
Kondo, Masao, to Nippon Gakki Seizo Kabushiki Kaisha. Switch operating mechanism. 4,434,340, Cl. 200-332.000.
Kondo, Toshio: *See*—
Ishikawa, Isao; Kanda, Miroshi; and Kondo, Toshio, 4,433,461, Cl. 29-25.350.
Kondou, Tomizou: *See*—
Narisawa, Shizuo; Taira, Yoshito; Yoshii, Yuuji; and Kondou, Tomizou, 4,434,257, Cl. 524-5.000.
Koning, Richard W.: *See*—
Anstey, Henry D.; Meiers, Gerald F.; and Koning, Richard W., 4,433,619, Cl. 100-40.000.
Konishi, Masaaki: *See*—
Kanamori, Kozo; Ishimoto, Akio; Konishi, Masaaki; Maita, Hitoshi; and Shimoyama, Hiroshi, 4,434,023, Cl. 156-307.300.
Konishiroku Photo Industry Co., Ltd.: *See*—
Ikemoto, Isao; Koiso, Junichi; Tamura, Akihiko; and Hirabayashi, Tsugio, 4,433,904, Cl. 355-3.0DD.
Sugita, Hiroshi; Tsuda, Yasuo; Ito, Kenji; and Shimba, Satoru, 4,434,225, Cl. 430-544.000.
Tarumi, Noriyoshi; Tamura, Akihiko; and Kokiso, Masakazu, 4,434,218, Cl. 430-96.000.
Konoshima, Katunaga, to Olympus Optical Co. Ltd. Light supply apparatus for endoscope. 4,433,675, Cl. 128-6.000.
Koopman, Donald E.: *See*—
Buirley, William L.; Koopman, Donald E.; McQuain, David B.; and Reeves, William H., 4,433,637, Cl. 116-207.000.
Koopman, Nicholas G.: *See*—
Bhattacharya, Somnath; Hu, Shih-Ming; Koopman, Nicholas G.; and Oldakowski, Chester C., 4,434,434, Cl. 357-71.000.

Koor Metals Ltd.: *See*—
Yerushalmi, Yaakov, 4,433,522, Cl. 52-426.000.

Koosha, Mansour, to Singer Company, The. Video projector adjustable support. 4,433,824, Cl. 248-662.000.

Kortenbach & Rauh Kommanditgesellschaft: *See*—
Schultes, Tilmann; and Seidel, Joachim, 4,433,699, Cl. 135-20.00R.

Kosek, Thomas P.: *See*—
Cornelius, Walter; Kosek, Thomas P.; and Klomp, Edward D., 4,433,540, Cl. 60-39.511.

Koshirakawa, Nobutaka: *See*—
Nagano, Toshio; Kobayashi, Toshiyuki; Koshirakawa, Nobutaka; and Inoue, Takeo, 4,433,724, Cl. 166-60.000.

Koto, Haruhiko, to Epson Corporation; and Kabushiki Kaisha Suwa Seikosha. Ink jet printer head. 4,434,430, Cl. 346-140.00R.

Kotrch, George S.: *See*—
Darrow, Russell E.; Funari, Joseph; Kotrch, George S.; and Phillips, George C., 4,434,134, Cl. 419-5.000.

Koutake, Masanobu: *See*—
Izutsu, Tadashi; Koutake, Masanobu; Hiraoka, Yasunobu; Takafuji, Shin-ichi; Yamada, Tamotsu; Kurosawa, Seiji; and Satoh, Tetsuo, 4,433,618, Cl. 99-455.000.

Koyanagi, Osamu: *See*—
Natsui, Ken-ichi; and Koyanagi, Osamu, 4,434,335, Cl. 200-148.00E.

Kozawa, Shigeyuki; Hasegawa, Noboru; and Kawahara, Hiroshi, to Asahi Glass Company, Ltd. Polyol for a polyurethane prepared by reacting an epoxide with the reaction product of a phenol, an aromatic amine, an aldehyde and a dialkanolamine. 4,434,277, Cl. 525-507.000.

Krakenberg, Manfred: *See*—
Dumm, Heinz; Koerner, Gotz; Krakenberg, Manfred; Rott, Hans; and Schmidt, Gunter, 4,434,008, Cl. 106-271.000.

Kranich, Klaus O.: *See*—
Odernheimer, Bernhard; Kremer, Johannes H.; and Kranich, Klaus O., 4,433,982, Cl. 55-158.000.

Kratzer, Adolf; and Dunnebier, Horst, to Klein, Schanzlin & Becker Aktiengesellschaft. Slurry feed pump for coal liquefaction reactors. 4,433,947, Cl. 406-99.000.

Kreczik, Stefan. Arrangement for connecting two pipe ends. 4,433,861, Cl. 285-305.000.

Kremer, Johannes H.: *See*—
Odernheimer, Bernhard; Kremer, Johannes H.; and Kranich, Klaus O., 4,433,982, Cl. 55-158.000.

Krimm, Heinrich: *See*—
Buysch, Hans-Josef; Krimm, Heinrich; and Rudolph, Hans, 4,434,105, Cl. 260-463.000.

Kroger, Haans H.: *See*—
Altmansberger, David C.; Huss, Christina L.; and Kroger, Haans H., 4,434,060, Cl. 210-724.000.

Krogsrud, Harald. Holder assembly for an electrode in an electrothermal smelting furnace. 4,434,496, Cl. 373-96.000.

Kroll, Hartmut: *See*—
Christ, Richard; and Kroll, Hartmut, 4,434,373, Cl. 250-506.100.

Krumm, Klaus D., to Luk Lamellen und Kupplungsbau GmbH. Diaphragm pump. 4,433,966, Cl. 417-571.000.

Kubota Ltd.: *See*—
Nakakita, Kiyomi; and Yamada, Keiichiro, 4,433,651, Cl. 123-188.00M.

Kubota, Tadashi; Hamane, Tokuhito; and Tasai, Masaaki, to Matsushita Electric Industrial Co., Ltd. Coil insertion apparatus. 4,433,475, Cl. 29-736.000.

Kucera, Ladislav: *See*—
Beriger, Conrad; Kucera, Ladislav; Schneider, Paul; and Spittaler, Gunther, 4,434,417, Cl. 338-53.000.

Kuda, Vladimir: *See*—
Cech, Miloslav; Kuda, Vladimir; and Vasicek, Vladimir, 4,433,705, Cl. 139-435.000.

Kudo, Tadato: *See*—
Kamada, Osao; Matsuga, Yoshiaki; Watase, Masami; Kudo, Tadato; Harada, Hiroyoshi; and Kanezaki, Atsushi, 4,434,022, Cl. 156-274.600.

Kuhlmann, George E.; and Hoover, Stephen V., to Standard Oil Company (Indiana). Maleic anhydride catalyst recycle. 4,434,244, Cl. 502-209.000.

Kulpa, Walter J.; and Paulik, John R., to Pitney Bowes Inc. End of stack sensor. 4,433,836, Cl. 271-3.100.

Kumagai, Tadashi: *See*—
Amano, Katsuhisa; Kumagai, Tadashi; Masaki, Akio; Shimada, Shinichi; Suzuki, Takeshi; and Ohtaka, Shoichi, 4,433,541, Cl. 60-293.000.

Kume, Toyohiko: *See*—
Saito, Junichi; and Kume, Toyohiko, 4,434,303, Cl. 568-686.000.

Kunevicius, Raymond A. Gun glove. 4,433,500, Cl. 42-1.00N.

Kunkel, Heinrich: *See*—
Olschewski, Armin; Brandenstein, Manfred; Walter, Lothar; and Kunkel, Heinrich, 4,433,768, Cl. 192-98.000.

Kuntzleman, Harry C.: *See*—
Dailey, Jack R.; Kuntzleman, Harry C.; Ng, Charles S.; and Pike, John W., 4,434,432, Cl. 346-154.000.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Fukuda, Hiroyuki; Kaji, Hisatsugu; and Fujimaki, Hiroto, 4,434,206, Cl. 428-288.000.
Kawasaki, Takao; Osaka, Yoshiaki; Komatsu, Katsumi; Yamaguchi, Yukiharu; and Ono, Saichi, 4,434,172, Cl. 424-270.000.
Sasaki, Tohru; Ohta, Mitsuru; Terasaki, Syuuzi; and Kakizaki, Syozo, 4,434,209, Cl. 428-416.000.

Kurihara, Kazuhiko: *See*—
Okada, Tokio; Kojima, Shigezo; Tani, Haruhisa; Kurihara, Kazuhiko; and Yazawa, Hirosi, 4,434,128, Cl. 264-560.000.

Kurihara, Shigeru; and Ohashi, Hiroyuki, to Asahi Kasei Kogyo Kabushiki Kaisha. Process for producing unsaturated nitrile. 4,434,029, Cl. 203-42.000.

Kuroda, Mitsuru. Apparatus for spreading and guiding a web of textile fabric. 4,433,460, Cl. 26-75.000.

Kuroda, Yasuo: *See*—
Omi, Kokichi; and Kuroda, Yasuo, 4,433,908, Cl. 355-68.000.

Kuroki, Takeo: *See*—
Shima, Eiji; Den, Hiroshi; and Kuroki, Takeo, 4,434,377, Cl. 307-147.000.

Kurosaka, Nobuo; Yasuda, Makoto; and Murakami, Tadateru, to Mitsui Petrochemicals Industry, Ltd. Process for production of hydroquinone. 4,434,305, Cl. 568-768.000.

Kurosawa, Seiji: *See*—
Izutsu, Tadashi; Koutake, Masanobu; Hiraoka, Yasunobu; Takafuji, Shin-ichi; Yamada, Tamotsu; Kurosawa, Seiji; and Satoh, Tetsuo, 4,433,618. Cl. 99-455.000.

Kurtz, John A.; and Cousens, Donald E., to Fairchild Camera and Instrument Corporation. Lead frame wire bonding by preheating. 4,434,347, Cl. 219-56.220.

Kurtz, Leonard D.; and LiCausi, Joseph M., to BioResearch Inc. Reusable tube connector assembly. 4,433,973, Cl. 604-403.000.

Kusebauch, Walter: *See*—
Emshoff, Horst W.; and Kusebauch, Walter, 4,434,058, Cl. 210-662.000.

Kyodo Yushi Co., Ltd.: *See*—
Kageyama, Hachiro; Moriuchi, Tsutomu; and Oikawa, Yoshiaki, 4,434,063, Cl. 252-25.000.

Kyuroku Corporation: *See*—
Takahashi, Soroku, 4,433,635, Cl. 114-301.000.

Laborie, Robert. Desk and panel structures having bristle-covered access to the interiors thereof. 4,433,630, Cl. 108-50.000.

Lachner, Walter: *See*—
Pietzsch, Herbert; Lachner, Walter; Hofmann, Karlheinz; Potzsch, Erich; and Esser, Fred, 4,434,494, Cl. 373-18.000.

LaHue, Philip M.: *See*—
Ott, Paul W.; Engebretson, Harold J.; LaHue, Philip M.; and Van Steenwyk, Brett H., 4,433,491, Cl. 33-302.000.

Lam, Hsiao-Ling: *See*—
Mahoney, Martin D.; Gaughan, Edmund J.; Pallos, Ferenc M.; and Lam, Hsiao-Ling, 4,434,000, Cl. 71-103.000.

Lam Research Corporation: *See*—
Koch, George R.; and Petersen, Carl T., III, 4,433,951, Cl. 414-217.000.

Laminations Corporation: *See*—
Bricco, Larry J., 4,433,843, Cl. 273-407.000.

Landstrom, Sven. Underwater missile for use against submerged submarines. 4,433,626, Cl. 102-390.000.

Lane, Michael J., to Smiths Industries Public Limited Company. Electrical equipment. 4,434,402, Cl. 324-393.000.

Lang, William H.: *See*—
Chang, Clarence D.; and Lang, William H., 4,434,299, Cl. 564-396.000.

Lange International S.A.: *See*—
Chalmers, Edward L., II; and Everest, David C., III, 4,433,457, Cl. 24-68.0SK.
Courvoisier, Guy; and Arieh, Simon, 4,433,494, Cl. 36-119.000.

Langer, Arthur W., Jr., to Exxon Research and Engineering Co. Preparation of linear olefin products. 4,434,312, Cl. 585-523.000.

Langer, Arthur W., Jr., to Exxon Research and Engineering Co. Preparation of linear olefin products. 4,434,313, Cl. 585-527.000.

Langley, Lawrence W.; and Bross, Roger B., to Kollmorgen Technologies Corporation. Motor with redundant windings. 4,434,389, Cl. 318-254.000.

Lantzsch, Reinhard: *See*—
Heinemann, Ulrich; Thomas, Rudolf; Lantzsch, Reinhard; Ditgens, Klaus; and Weber, Erhard, 4,434,292, Cl. 548-373.000.

LaPasso, Leonard J.: *See*—
Benoit, Harold P.; LaPasso, Leonard J.; and McBain, Ian, 4,433,590, Cl. 74-409.000.

Larkin, John M.; Watts, Lewis W., Jr.; and Marquis, Edward T., to Texaco Inc. Manufacture of synthetic lubricant additives from internal olefins using boron trifluoride catalysis. 4,434,308, Cl. 585-10.000.

Larkin, John M.; and Brader, Walter H., Jr., to Texaco Inc. Oligomerization of predominantly low molecular weight olefins over boron trifluoride in the presence of a protonic promoter. 4,434,309, Cl. 585-10.000.

Larkins, Thomas H., Jr., to Eastman Kodak Company. Catalyst recovery process from tar from carbonylation reactions. 4,434,241, Cl. 502-24.000.

Lary, Richard F.: *See*—
Rubinson, Barry L.; Parenti, Mark A.; Lary, Richard F.; and Gardner, Edward A., 4,434,487, Cl. 371-10.000.

Latimer, William A. Storage and shipping unit. 4,433,513, Cl. 52-36.000.

Latone, Salvatore: *See*—
Romanowski, Robert F., 4,433,837, Cl. 271-293.000.

La Torra, Michael N.: *See*—
Petriello, John V.; and La Torra, Michael N., 4,434,197, Cl. 427-407.100.

Lavender, Gerry R.; and Chance, James O., Jr., to Smith International, Inc. Method for securing a wear sleeve about a drill pipe. 4,434,125, Cl. 264-262.000.

Layotte, Pierre-Claude; and Bozec, Laurent, to Institut Francais du Petrole; and Compagnie Generale de Geophysique. Device for avoiding secondary impacts resulting from the bounces of a mass against a target-member. 4,433,736, Cl. 173-94.000.
Lazarus, Wayne P. Razor assembly. 4,433,483, Cl. 30-41.000.
Lazerson, Max M.: *See*—
Bohme, Rolf C.; and Lazerson, Max M., 4,434,365, Cl. 250-255.000.
LeBlanc, James C. Control means for engine cooling systems. 4,433,648, Cl. 123-41.120.
Leco Inc.: *See*—
Bose, Ajit, 4,434,129, Cl. 264-557.000.
Ledebrink, Wilhelm: *See*—
Stoll, Wolfgang; and Ledebrink, Wilhelm, 4,434,137, Cl. 423-6.000.
Lee, John F.: *See*—
Maio, Patrick S.; and Lee, John F., 4,433,778, Cl. 206-45.250.
Lee, John M.; and Bauman, William C., to Dow Chemical Company, The. Ion exchange resins for uranium recovery. 4,434,138, Cl. 423-7.000.
Lee, Shih-Ying, to Setra Systems, Inc. Linear motion linkage. 4,433,742, Cl. 177-229.000.
Leining, Lyndon R.; and Simonson, Kent L., to Geo. A. Hormel & Company. Shoulder skinning device. 4,433,453, Cl. 17-21.000.
Leistner, Herbert E.: *See*—
Figge, Siegfried E. O.; and Leistner, Herbert E., 4,433,782, Cl. 206-338.000.
Leland Stanford Junior University, The Board of Trustees of the: *See*—
Keith, Douglas L., 4,434,042, Cl. 204-298.000.
Lemelson, Jerome H. Communication system and method. 4,434,510, Cl. 455-603.000.
Lemke, Norbert, to Heitlinger, Paul; and Rodder, Fritz. Process for stereoscopic picture reproduction, in particular in respect of X-ray pictures. 4,434,500, Cl. 378-99.000.
Lempert, Karoly; Harsanyi, Kalman; Doleschall, Gabor; Hornyak, Gyula; Nyitrai, Jozsef; Zauer, Karoly; Fetter, Jozsef; Simig, Gyula; Gombos nee Visky, Zsuzsanna; and Szalai nee Barta, Gizella, to Richter Gedeon Vegyeszeti Gyar Rt. Beta-lactam compounds containing a protected C-acetyl group, process for their preparation and pharmaceutical compositions containing them. 4,434,099, Cl. 260-239.00A.
Lemstra, Pieter J.: *See*—
Dorrestijn, Antoon; Lemstra, Pieter J.; and Van Unen, Lambert H. T., 4,434,252, Cl. 521-134.000.
Lenox, Arthur. Air filtration device. 4,433,987, Cl. 55-319.000.
Lenox, Ronald S.; and Sparks, Moses, Jr., to Armstrong World Industries, Inc. Process for reproducibly preparing uniform dry ink compositions comprising water-soluble cationic dyestuffs. 4,434,007, Cl. 106-26.000.
Leopold & Co. Chem. Pharm. Fabrik Gesellschaft m.b.H.: *See*—
Jeretin, Stojan; Groke, Karl; and Musil, Horst E., 4,434,160, Cl. 424-180.000.
Le Roy, Ernest. Drinking trough for poultry. 4,433,642, Cl. 119-78.000.
Leslie Metal Arts Company: *See*—
Baker, Clayton C., 4,433,885, Cl. 312-305.000.
L'Etat Francais, represente par le Ministre des P.T.T. (Centre National d'Etudes des Telecommunications): *See*—
Motsch, Roger; Roussel, Francoise; and Lolivier, Germain, 4,434,499, Cl. 375-122.000.
Lever Brothers Company: *See*—
Billington, Reginald; Edge, David J.; and Winterbotham, Peter, 4,434,088, Cl. 252-547.000.
Billington, Reginald; Edge, David J.; and Winterbotham, Peter, 4,434,089, Cl. 252-547.000.
Cox, Ian R.; and Jones, Keith, 4,434,091, Cl. 252-557.000.
Delwel, Francois; and De Goede, Roland, 4,434,068, Cl. 252-135.000.
Hampson, Jeffrey D.; and Billington, Reginald, 4,434,087, Cl. 252-545.000.
Hampson, Jeffrey D.; Billington, Reginald; and Cox, Ian R., 4,434,090, Cl. 252-547.000.
Levine, Joshua L., to North American Philips Corporation. Device for measurement of the torsional angular deviation of a loaded rotating or static shaft. 4,433,585, Cl. 73-862.340.
Levine, Stephen N.; Dabbish, Ezzat A.; and Byrns, John P., to Motorola, Inc. Scrambler key code synchronizer. 4,434,323, Cl. 178-22.170.
Levinson, George. Modification of an internal combustion engine so as to operate permanently with a reduced number of cylinders. 4,433,657, Cl. 123-198.00F.
Lew, Hyok S. Coil curtain. 4,433,711, Cl. 160-120.000.
Lewis, Walter E. F., to Union Carbide Corporation. Water-based energy transmitting fluid compositions. 4,434,066, Cl. 252-77.000.
LGZ Landis & Gyr Zug AG: *See*—
Halder, Mathis; Widmer, Jakob; and De Vries, Jacob, 4,434,400, Cl. 324-110.000.
Liauw, Koei-Liang: *See*—
Spiegelman, Gerald; and Liauw, Koei-Liang, 4,434,102, Cl. 260-429.700.
Liberboim, Gidon. Tennis ball holder belt. 4,433,803, Cl. 224-251.000.
LiCausi, Joseph M.: *See*—
Kurtz, Leonard D.; and LiCausi, Joseph M., 4,433,973, Cl. 604-403.000.
Licentia Patent-Verwaltungs-GmbH: *See*—
Koeck, Klaus; Bambach, Wolfgang; Ruopp, Gerhard; and Mikley, Frank, 4,434,326, Cl. 179-2.0DP.
Licht, Richard R.; Marlor, Alan J.; and Peisert, Joseph C., to Minnesota Mining and Manufacturing Company. Cable tray protection system. 4,433,732, Cl. 169-48.000.
Lichtner, Emil; Ungeringer, Gerd; and Giebel, Gerhard, to Klockner-Humboldt-Deutz Aktiengesellschaft. Light metal cylinder head for a valve-controlled internal combustion engine. 4,433,653, Cl. 123-193.00H.
Lidereau, Rosette: *See*—
Bisagni, Emile; Ducrocq, Claire; Rivalle, Christian; Tambourin, Pierre; Wendling, Francoise; Civier, Alain; Montagnier, Luc; Chermann, Jean-Claude; Gruest, Jacqueline; and Lidereau, Rosette, 4,434,290, Cl. 546-70.000.
Liesch, Jean; Reiff, Nico; Reimen, Vlasta; Schmit, Romain; Schummer, Arthur; Simon, Jo; and Tonteling, Paul, to ARBED, S.A. Method of measuring the reducing power of gases over the charge in a blast furnace. 4,434,368, Cl. 250-339.000.
Liesch, Jean-Francois: *See*—
Metz, Paul; Schleimer, Francois; Goedert, Ferdinand; Henrion, Romain; Klein, Henri; and Liesch, Jean-Francois, 4,434,005, Cl. 75-60.000.
Lillie, Terrance L.: *See*—
Couper, Robert A.; and Lillie, Terrance L., 4,434,419, Cl. 340-717.000.
Lin, Jiang-Jen, to Texaco Inc. Process for preparing alkanols from synthesis gas. 4,434,248, Cl. 518-700.000.
Lin, Rucy Y., to Stauffer Chemical Company. Compacting polycarbonate and copoly(carbonate/phosphonate) particles. 4,434,118, Cl. 264-109.000.
Lincoln Laser Company: *See*—
Hanson, Derald F.; and Sherman, Randy J., 4,433,894, Cl. 350-6.800.
Lindahl, Bruce C., to FluiDyne Engineering Corporation. Method and apparatus for producing a useful stream of hot gas from a fluidized bed combustor while controlling the bed's temperature. 4,433,631, Cl. 110-245.000.
Linde Aktiengesellschaft: *See*—
Weber, Guenter, 4,434,143, Cl. 423-226.000.
Weber, Guenter, 4,434,145, Cl. 423-226.000.
Weber, Guenter, 4,434,146, Cl. 423-226.000.
Linder, Wolfgang; Arend, Gunter; Barnikel, Carl-Dieter; and Frauenkron, Gunter, to Bayer Aktiengesellschaft. Granulate-form powder agglomerates of pulverulent rubber chemicals and a process for production. 4,434,070, Cl. 523-323.000.
Lindquist, William W. Adjustable flanged fitting for roof openings. 4,433,860, Cl. 285-192.000.
Lindsay, Erin J.; and Snyder, Jeffrey T., to Minnesota Mining and Manufacturing Company. Integrated cardioplegia delivery system. 4,433,971, Cl. 604-122.000.
Liou, Shu L. Toilet seat and cover operating device. 4,433,442, Cl. 4-251.000.
Lisec, Peter. Device for assembling insulating glass panes. 4,434,024, Cl. 156-556.000.
Lisi, John E.: *See*—
Edwards, Ralston G., Jr.; Walkden, John R. B.; Carstensen, Walter H.; Murphy, Gregory E.; and Lisi, John E., 4,433,776, Cl. 198-779.000.
Livesey, Declan B.; and Toma, Petre, to Texaco Canada Resources Ltd. Filter for separating discrete solid elements from a fluid stream. 4,434,054, Cl. 210-484.000.
Lizzio, Vincent P. Solenoid operated service brake application unit. 4,433,763, Cl. 192-4.00A.
Locher, Engelbert: *See*—
Hartman, Ludwig; Ruzek, Ivo; and Locher, Engelbert, 4,434,204, Cl. 428-198.000.
Loizeau, Pierre; and Carmillet, Roger, to Valeo. Torsional dampers. 4,433,770, Cl. 192-106.200.
Lolivier, Germain: *See*—
Motsch, Roger; Roussel, Francoise; and Lolivier, Germain, 4,434,499, Cl. 375-122.000.
Lomas, David A.; and Thompson, Gregory J., to UOP Inc. Fluid particle cooling process and apparatus. 4,434,245, Cl. 502-2.000.
Lombardino, Joseph G., to Pfizer Inc. Water-soluble benzothiazine dioxide salts. 4,434,163, Cl. 424-246.000.
Lombardino, Joseph G., to Pfizer Inc. Crystalline benzothiazine dioxide salts. 4,434,164, Cl. 424-246.000.
Longfield, James E., to American Cyanamid Company. Polyepichlorohydrin elastomers having improved resistance to sour gasoline. 4,434,275, Cl. 525-403.000.
Longo, John M.: *See*—
Horowitz, Hugh H.; Horowitz, Harold S.; and Longo, John M., 4,434,031, Cl. 204-59.00R.
Lopes, Richard R., to Stone Container Corporation. Blank conveyor apparatus. 4,433,774, Cl. 198-689.000.
Lorenzi, Donald E.: *See*—
Clarke, Frederick; Lorenzi, Donald E.; and Schaefer, Edward F., 4,434,427, Cl. 346-33.00P.
Lorenzi, Mario: *See*—
Boggio, Giuseppe; and Lorenzi, Mario, 4,434,324, Cl. 178-69.00R.
Loth, Eric: *See*—
Gogniat, Paul; and Loth, Eric, 4,433,921, Cl. 368-294.000.
Louisiana State University Board of Supervisors: *See*—
Callihan, Clayton D., 4,433,553, Cl. 62-94.000.
Loutfy, Raouf O.: *See*—
Withers, James C.; and Loutfy, Raouf O., 4,434,149, Cl. 423-496.000.
Lowe, Gary E., to GTE Products Corporation. Process and apparatus for forming lamp capsules. 4,434,386, Cl. 313-331.000.
Lowstuter, W. Robert. Earth tempered building design system. 4,433,720, Cl. 52-169.110.

Luca, Vincent A., Jr.: *See*—
Ratchford, Lloyd G.; Werth, Dee A.; Luca, Vincent A., Jr.; and Schildkraut, Alan L., 4,433,889, Cl. 339-94.00M.

Lucas Industries Limited: *See*—
Farr, Glyn P. R., 4,433,873, Cl. 303-24.00A.
Thomas, Alfred W.; and Heibel, Helmut, 4,433,543, Cl. 60-547.100.

Lucas, Thomas M.: *See*—
Bairen, Donald J.; and Lucas, Thomas M., 4,433,870, Cl. 297-16.000.

Luchinger, Paul, to Mettler Instrument AG. Weighing apparatus including a resiliently connected scale pan carrier. 4,433,740, Cl. 177-187.000.

Luk Lamellen und Kupplungsbau GmbH: *See*—
Krumm, Klaus D., 4,433,966, Cl. 417-571.000.

Lummus Company, The: *See*—
Schindler, Harvey D., 4,434,048, Cl. 208-112.000.

Lunden, Richard W.: *See*—
Swift, Harold E.; and Lunden, Richard W., 4,434,281, Cl. 526-119.000.

Lundgren, Roy L. Device for generating electricity by pedestrian and vehicular traffic. 4,434,374, Cl. 290-1.00R.

Lundquist, Joseph T., Jr.: *See*—
Wszolek, Walter R.; and Lundquist, Joseph T., Jr., 4,434,215, Cl. 429-144.000.

Macaster Controls, Inc.: *See*—
Boyce, William A., 4,433,489, Cl. 33-203.180.

MacMaster, George H.; and Nichols, Lawrence J., to Raytheon Company. DC Isolated RF transition for cathode-driven crossed-field amplifier. 4,434,387, Cl. 315-39.300.

Mader, Karl-Heinz: *See*—
Cook, Lee M.; Mader, Karl-Heinz; and Schnabel, Roland, 4,434,191, Cl. 427-165.000.

Maes, Randell P.: *See*—
Cherry, Raymond L.; Pfeiffer, Gene F.; and Maes, Randell P., 4,433,719, Cl. 165-26.000.

Magnaflux Corporation: *See*—
Clarke, Frederick; Lorenzi, Donald E.; and Schaefer, Edward F., 4,434,427, Cl. 346-33.00P.

Magnusson, Jan, to Jede-Automater Magnusson AB. Apparatus for preparing and dispensing beverages. 4,433,617, Cl. 99-305.000.

Mahoney, Martin D.; Gaughan, Edmund J.; Pallos, Ferenc M.; and Lam, Hsiao-Ling, to Stauffer Chemical Company. N-(Benzenesulfonyl) carbamates herbicidal antidotes. 4,434,000, Cl. 71-103.000.

Maiefski, Romaine R.; and Puglisi, Albert J., to Maiefski, Romaine R. Liquid metering and dispensing system. 4,433,795, Cl. 222-14.000.

Maier, Karl: *See*—
Marino, Vincent E.; Nicola, Robert J.; Maier, Karl; and Stockinger, Richard W., 4,433,890, Cl. 339-97.00C.

Maier, Ludwig, to Ciba-Geigy Corporation. Herbicidally active 2-nitro-5-(2'-chloro-4'-trifluoromethylphenoxy)phenylphosphinic acid derivatives. 4,434,108, Cl. 260-951.000.

Main, Keith A.; and Hillstrom, David U., to Marketing Displays, Inc. Sign bracket. 4,433,935, Cl. 403-385.000.

Maio, Patrick S.; and Lee, John F., to Federal Paper Board Co., Inc. Automatic tilt display carton. 4,433,778, Cl. 206-45.250.

Maita, Hitoshi: *See*—
Kanamori, Kozo; Ishimoto, Akio; Konishi, Masaaki; Maita, Hitoshi; and Shimoyama, Hiroshi, 4,434,023, Cl. 156-307.300.

Majik-Ironers, Inc.: *See*—
Foster, Edwin E.; Foster, Wilbur A.; and Foster, Thomas E., 4,433,497, Cl. 38-107.000.

Makino, Yoshimi: *See*—
Uedaira, Satoru; Shimizu, Hidetoshi; Tamura, Hidemasa; Taguchi, Hiromichi; Yamanoi, Hiroshi; and Makino, Yoshimi, 4,434,202, Cl. 428-143.000.

Malandra, Louis J.: *See*—
Spiegelman, Stanley R.; Salton, Robert B.; Beer, Robert W.; Malandra, Louis J.; and Cognevich, Michael L., 4,433,828, Cl. 254-29.00A.

Malfitano, Amanda. Sanitary napkin. 4,433,972, Cl. 604-385.000.

Malish, Terrance J.; and Somrack, Lawrence A. Adapter device for brooms or the like. 4,433,931, Cl. 403-194.000.

Malloy, Richard J., to United States of America, Navy. Water jet sediment probe. 4,433,737, Cl. 175-5.000.

Malone, Thomas J.; and Ragsdale, Mark E., to Milliken Research Corporation. Powdered cleaning composition. 4,434,067, Cl. 252-88.000.

Maloney-Crawford Corporation: *See*—
Hodgson, Robert A.; and Martinez, Sam J., 4,433,983, Cl. 55-171.000.

Malooley, Rudolph S.: *See*—
Sarnoff, Stanley J.; Malooley, Rudolph S.; Calkins, George B.; and Tarello, William R., 4,433,684, Cl. 128-203.210.

Mandel, George. Opening and stopper device. 4,433,792, Cl. 220-269.000.

Mangia, Alberto: *See*—
Giobbio, Vincenzo; Ornato, Giorgio; Buracchi, Livio; and Mangia, Alberto, 4,434,097, Cl. 260-112.50R.

Manizza, Guelfo A.: *See*—
Ganz, Robert H.; and Manizza, Guelfo A., 4,433,806, Cl. 229-40.000.

Mannesmann Demag AG: *See*—
Ratschat, Gunter, 4,434,004, Cl. 75-41.000.

Manning, Donald L., to Transpec, Inc. Combined vent and escape hatch. 4,433,506, Cl. 49-141.000.

Mantela, Ralph F., to General Motors Corporation. Method for making a resilient tie-down device. 4,434,124, Cl. 264-229.000.

Mar-Kay Plastics, Inc.: *See*—
Brown, Bobby L., 4,433,625, Cl. 102-331.000.

Marathon Oil Company: *See*—
Argabright, Perry A.; and Rhudy, John S., 4,433,727, Cl. 166-252.000.
Sydansk, Robert D.; and Gucwa, Paul R., 4,433,728, Cl. 166-270.000.
Sydansk, Robert D., 4,433,729, Cl. 166-270.000.

Maravelas, William S., Jr.; Bighley, Alexandria D.; and Calabrese, Marco A., to Deck the Halls, Inc. Free standing modular unit for storing, displaying, and selling merchandise. 4,433,880, Cl. 312-3.000.

Marconi Company Limited, The: *See*—
Old, Julian C., 4,434,424, Cl. 343-381.000.

Marconi Instruments Limited: *See*—
Blyth, Geoffrey C., 4,434,489, Cl. 371-29.000.

Mardis, Wilbur S.; and Finlayson, Claude M., to NL Industries, Inc. Anionically modified organophilic clays and their preparation. 4,434,075, Cl. 252-315.200.

Mardis, Wilbur S.; and Finlayson, Claude M., to NL Industries, Inc. Clay cation complexes and their use to increase viscosity of liquid organic systems. 4,434,076, Cl. 252-315.200.

Marino, Vincent E.; Nicola, Robert J.; Maier, Karl; and Stockinger, Richard W. Connectors for flexible printed circuits and method therefor. 4,433,890, Cl. 339-97.00C.

Markel, Morris L.: *See*—
Rascati, Richard J.; and Berglund, Larry G., 4,433,923, Cl. 374-112.000.

Marketing Displays, Inc.: *See*—
Main, Keith A.; and Hillstrom, David U., 4,433,935, Cl. 403-385.000.

Markey, Harold G.: *See*—
Barner, Robert P., Jr.; Bensadon, Joseph M.; Besseyre, Jacques A.; and Markey, Harold G., 4,434,486, Cl. 370-110.100.

Marks, George B., Sr.; and Fearing, D. Michael, to Fearing Manufacturing Co., Inc. Teat dip. 4,434,181, Cl. 424-326.000.

Marlor, Alan J.: *See*—
Licht, Richard R.; Marlor, Alan J.; and Peisert, Joseph C., 4,433,732, Cl. 169-48.000.

Marmarosi nee Kellner, Katalin: *See*—
Horvath, Tibor; Udvardy, Agnes; David, Agoston; and Marmarosi nee Kellner, Katalin, 4,434,152, Cl. 424-19.000.

Marquardt, Kurt, to Hager & Elsasser GmbH. Water purification utilizing plural semipermeable membrane stages. 4,434,057, Cl. 210-638.000.

Marquis, Edward T.: *See*—
Larkin, John M.; Watts, Lewis W., Jr.; and Marquis, Edward T., 4,434,308, Cl. 585-10.000.

Mars Alcatel: *See*—
Santinelli, Joseph, 4,433,569, Cl. 72-410.000.

Marsh, Dana G.; Shuey, David R.; and Webb, John L., to Xerox Corporation. Fusing system. 4,434,353, Cl. 219-216.000.

Martel, Jacques; Tessier, Jean; and Teche, Andre, to Rousel Uclaf. Preparation of α-cyano-phenoxy-benzyl esters. 4,434,294, Cl. 549-65.000.

Martel, Thomas J.: *See*—
Bowen, Robert F.; and Martel, Thomas J., 4,434,343, Cl. 219-10.55F.

Martin, Joel L., to Phillips Petroleum Company. Aqueous titanation of catalyst support containing chromium with solubilized $Ti(OR)_4$. 4,434,243, Cl. 502-171.000.

Martinez, Sam J.: *See*—
Hodgson, Robert A.; and Martinez, Sam J., 4,433,983, Cl. 55-171.000.

Mary, Paul. Method for preparing radioactive control rods from nuclear reactors for storage or disposal. 4,434,092, Cl. 252-626.000.

Masaki, Akio: *See*—
Amano, Katsuhisa; Kumagai, Tadashi; Masaki, Akio; Shimada, Shinichi; Suzuki, Takeshi; and Ohtaka, Shoichi, 4,433,541, Cl. 60-293.000.

Masaki, Kenji; and Yasuhara, Seishi, to Nissan Motor Co., Limited. Exhaust gas recirculation system for diesel engine. 4,433,666, Cl. 123-569.000.

Maschhoff, Jack. Building wall construction. 4,433,520, Cl. 52-275.000.

Maschinenfabrik Augsburg-Nurnberg AG: *See*—
Bacher, Walter; and Jacob, Eberhard, 4,434,139, Cl. 423-19.000.

Maslanka, William W.; and Spence, Gavin G., to Hercules Incorporated. Organic pigments. 4,434,267, Cl. 524-458.000.

Masten, Billy R.: *See*—
Woosley, Alan H.; and Masten, Billy R., 4,434,360, Cl. 235-472.000.

Masters, Joseph I.; and Goldberg, Gershon M., to GCA Corporation. Chalcogenide product. 4,434,217, Cl. 430-9.000.

Mathews, Lester R., to Mathews, Lester R.; Warner, Lucien; and Water Circulation Patents, part interest to each. Pool nozzle head removing and replacing tool. 4,433,863, Cl. 294-19.00R.

Mathieu, Michel, to Telediffusion de France. Process and apparatus for synchronization of digital signals. 4,434,498, Cl. 375-114.000.

Mathou, Marcel. Play pen. 4,433,447, Cl. 5-93.00R.

Matson, John S., to Nostam, Inc. Method and apparatus for slip-connector structural joint. 4,433,524, Cl. 52-665.000.

Matsuda, Kazuo; Ohashi, Makoto; Satoh, Yoshio; Miyashita, Tsutomu; and Komenou, Kazunari, to Fujitsu Limited. Magnetic bubble memory device and method for operating the same. 4,434,476, Cl. 365-12.000.

Matsuga, Yoshiaki: *See*—
Kamada, Osao; Matsuga, Yoshiaki; Watase, Masami; Kudo, Tadato; Harada, Hiroyoshi; and Kanezaki, Atsushi, 4,434,022, Cl. 156-274.600.

Matsui, Kazuhiro, to Hoshino Gakki Co., Ltd. Fixture for string retainer of the strings. 4,433,605, Cl. 84-299.000.

Matsui, Kazuma: *See*—
Hattori, Yoshiyuki; Matsui, Kazuma; and Kinbara, Hiroji, 4,433,965, Cl. 474-201.000.

Matsumoto, Seiichiro: *See*—
Kamo, Mutsukazu; Matsumoto, Seiichiro; Sato, Yoichiro; and Setaka, Nobuo, 4,434,188, Cl. 427-39.000.

Matsumoto, Shohei: *See*—
Sakuma, Isamu; Nishida, Katsuhiko; Kawano, Hideo; Ueno, Masayasu; Matsumoto, Yoshishige; Matsumoto, Shohei; and Furuse, Takao, 4,434,491, Cl. 372-48.000.

Matsumoto, Yoshishige: *See*—
Sakuma, Isamu; Nishida, Katsuhiko; Kawano, Hideo; Ueno, Masayasu; Matsumoto, Yoshishige; Matsumoto, Shohei; and Furuse, Takao, 4,434,491, Cl. 372-48.000.

Matsushita Electric Industrial Co., Ltd.: *See*—
Fujimoto, Makoto, 4,434,435, Cl. 358-44.000.
Hamabe, Takeshi; Wada, Hidekazu; Naruse, Mikio; and Nishimori, Toshiyuki, 4,434,452, Cl. 361-304.000.
Kubota, Tadashi; Hamane, Tokuhito; and Tasai, Masaaki, 4,433,475, Cl. 29-736.000.
Miyake, Hideyuki; and Nakamura, Tosiaki, 4,434,410, Cl. 333-224.000.
Nankai, Shiro; Nakamura, Ken-ichi; and Iijima, Takashi, 4,434,229, Cl. 435-174.000.
Rzeszewski, Theodore S., 4,434,438, Cl. 358-167.000.

Matsushita Electric Works, Ltd.: *See*—
Touho, Makoto; Wada, Shigeaki; and Yamamoto, Minoru, 4,434,385, Cl. 313-161.000.
Yorifuji, Yuki; Uyama, Seiichi; Fukutake, Katsuhiko; and Miyazaki, Masaharu, 4,434,363, Cl. 250-214.00B.

Matsuzawa, Masanao: *See*—
Fujiwara, Hitoshi; and Matsuzawa, Masanao, 4,433,925, Cl. 400-88.000.

Mauldin, Donald M.; and Jones, Richard E., III. Knee and elbow brace. 4,433,679, Cl. 128-80.00F.

Mauleon, Jean L.: *See*—
Dean, Robert R.; Mauleon, Jean L.; and Newman, Robert J., 4,434,049, Cl. 208-153.000.

Maxwell, Gary G. Fishing lure retrieving device. 4,433,501, Cl. 43-17.200.

Mayfran, Inc.: *See*—
Hollowell, Barry S., 4,433,775, Cl. 198-742.000.

McAlister, Roy E. Multiple fluid medium system. 4,433,557, Cl. 62-324.100.

McBain, Ian: *See*—
Benoit, Harold P.; LaPasso, Leonard J.; and McBain, Ian, 4,433,590, Cl. 74-409.000.

McCaskill, Rex A.; McInroy, John W.; and Waldo, Paul D., to International Business Machines Corporation. Method of entering criteria for selecting records of spatially related data stored in an interactive text processing system. 4,434,475, Cl. 364-900.000.

McCoy, Kenneth H.; and Romain, John, to Romain, John. Exercise-massaging device. 4,433,683, Cl. 128-57.000.

McCullough, Harold E.: *See*—
Karga, James D.; and McCullough, Harold E., 4,433,477, Cl. 29-764.000.

McCunn, Myron L., to Deere & Company. Lawn mower bagging system including air assist. 4,433,532, Cl. 56-320.200.

McDaniel, Max P.; and Welch, M. Bruce, to Phillips Petroleum Company. Polymerization process using surface heat treated silica-containing catalyst base. 4,434,280, Cl. 526-106.000.

McDermott, William E.: *See*—
Benard, David J.; Pchelkin, Nicholas R.; McDermott, William E.; Ellis, David E.; and Miller, George W., 4,434,492, Cl. 372-59.000.

McDonnell Douglas Corporation: *See*—
Chen, Yung J.; and Mei, Eden Y. C., 4,434,479, Cl. 365-210.000.

McDonough, Kevin C.; Hayn, John W.; and Bellay, Jeffrey D., to Texas Instruments Incorporated. Shared microinstruction states in control ROM addressing for a microcoded single chip microcomputer. 4,434,465, Cl. 364-200.000.

McDougal, Allan R.: *See*—
Hale, Robert R.; and McDougal, Allan R., 4,433,672, Cl. 126-419.000.

McDowell, Curtis S., to Cellu-Craft Inc. Solids-liquid separation. 4,434,061, Cl. 210-787.000.

McElroy, Lucian G.; and Day, David R. Secondary bag adjustment. 4,433,450, Cl. 15-316.00R.

McGary, Charles W., Jr.; Pascarella, Vincent J.; Taller, Robert A.; Rhodes, Delmer R.; Anglin, Paul E.; and Daugherty, Charles W., to Warner-Lambert Company. Powder coating process for forming soft flexible polyurethane film. 4,434,126, Cl. 264-303.000.

McGee, Terrill A. Air scrubbing and purifying system. 4,433,985, Cl. 55-217.000.

McGraw, Isaac R., to Pennwalt Corporation. Use of haloprogin to treat *Herpes labialis*. 4,434,183, Cl. 424-340.000.

McHenry, Kelly D.: *See*—
Koepke, Barry G.; and McHenry, Kelly D., 4,433,980, Cl. 51-308.000.

McInroy, John W.: *See*—
McCaskill, Rex A.; McInroy, John W.; and Waldo, Paul D., 4,434,475, Cl. 364-900.000.

McNab, Ian R.: *See*—
Deis, Daniel W.; McNab, Ian R.; and Smith, Joseph L., Jr., 4,433,608, Cl. 89-8.000.

McNeal, Ronald E.: *See*—
Sharber, Jerry L.; and McNeal, Ronald E., 4,433,499, Cl. 40-356.000.

McQuain, David B.: *See*—
Buirley, William L.; Koopman, Donald E.; McQuain, David B.; and Reeves, William H., 4,433,637, Cl. 116-207.000.

McShane, James E., to Plough, Inc. Tanning and ultra-violet screening composition having high stability. 4,434,154, Cl. 424-60.000.

Mead, Albert R., to Grumman Aerospace Corporation. Method for working holes. 4,433,567, Cl. 72-342.000.

Medi-Physics, Inc.: *See*—
Byrne, Edmund F.; and Tolman, Glen L., 4,434,151, Cl. 424-1.100.

Mei, Eden Y. C.: *See*—
Chen, Yung J.; and Mei, Eden Y. C., 4,434,479, Cl. 365-210.000.

Meiers, Gerald F.: *See*—
Anstey, Henry D.; Meiers, Gerald F.; and Koning, Richard W., 4,433,619, Cl. 100-40.000.

Meinguss, Alain; and Despres, Bernard, to Electronique Marcel Dassault. Transistor integrated circuit protected against the analysis, and a card comprising such a circuit. 4,434,361, Cl. 235-192.000.

Meister, Alton; and Williamson, Joanne M., to Cornell Research Foundation. Cysteine delivery system. 4,434,158, Cl. 424-94.000.

Melan, Giuseppe; Verdet, Pierre; and Besenval, Christian, to Societe Vetrotex Saint-Gobain. Apparatus for the manufacturing of fibers. 4,433,991, Cl. 65-1.000.

Mellon, Timothy; and Carlson, Gustaf B., to Independent Systems Corporation. Insulating device for impeding heat flow. 4,433,712, Cl. 160-122.000.

Melvin, Raymond C., to Harnischfeger Corporation. Crawler shoe having work-hardened pin-receiving hole. 4,433,874, Cl. 305-53.000.

Mendel, Jack M.; Bomgardner, Carl C.; Rack, Robert W.; Scott, Donald G.; and Stritmater, August W., to International Paper Company. Resin catalyzation control systems. 4,433,917, Cl. 366-132.000.

Mentzer, William R.; and Bernabe, Vincent, Jr., to Kidde, Inc. Remotely operable latch and locking pin for a multi-section boom including a manual fly section. 4,433,515, Cl. 52-115.000.

Menzies, Robert T.: *See*—
Kavaya, Michael J.; and Menzies, Robert T., 4,434,490, Cl. 372-20.000.

Merck & Co., Inc.: *See*—
Doherty, James B.; Chang, Michael N.; and Dorn, Conrad P., 4,434,175, Cl. 424-274.000.
Gibilisco, Kenneth J., 4,433,789, Cl. 215-220.000.
Vickers, Stanley, 4,434,177, Cl. 424-280.000.

Merck Patent Gesellschaft mit beschrankter Haftung: *See*—
Eichler, Jurgen; Herz, Claus; and Neisius, Karl-Heinz, 4,434,035, Cl. 204-159.130.
Sucrow, Wolfgang; Murawski, Hans-Rudiger; Minas, Hermann; and Stegemeyer, Horst, 4,434,073, Cl. 252-299.620.

Merrill, Bruce: *See*—
Kleykamp, Gayheart C.; Goldwater, Sam; and Salsbery, Charles L., 4,434,436, Cl. 358-118.000.

Merritt, William H. Differential light emission translucent light bowl and cap. 4,434,455, Cl. 362-307.000.

Messier-Hispano-Bugatti (S.A.): *See*—
Turiot, Andre, 4,433,820, Cl. 244-102.00R.

Metal, Israel, to Raytheon Company. Radiographic camera. 4,434,369, Cl. 250-363.00S.

Mettler Instrument AG: *See*—
Luchinger, Paul, 4,433,740, Cl. 177-187.000.

Metz, Paul; Schleimer, Francois; Goedert, Ferdinand; Henrion, Romain; Klein, Henri; and Liesch, Jean-Francois, to Arbed S. A. (Luxembourg). Method of and apparatus for refining a melt containing solid cooling material. 4,434,005, Cl. 75-60.000.

Meyer, Hans R., to Ciba-Geigy Corporation. Cationic fluorescent whitening agents. 4,433,975, Cl. 8-648.000.

Mi-Jack Products, Inc.: *See*—
Glickman, Myron, 4,433,952, Cl. 414-460.000.

Michel, Ugon; and Herve, Robert, to Cii/Honeywell Bull (Societe Anonyme). Method and device for storing logic representations of process states. 4,434,473, Cl. 364-900.000.

Midland-Ross Corporation: *See*—
Jwuc, Karl J., 4,433,834, Cl. 267-141.100.

Miedaner, Horst; and Spirk, Herbert. Block or brick for the construction of a two-shell tile stove. 4,433,523, Cl. 52-592.000.

Mikami, Takashi: *See*—
Fujii, Shigeo; Ikeda, Tokuzo; Mikami, Takashi; and Okano, Shuji, 4,434,205, Cl. 428-218.000.

Mikley, Frank: *See*—
Koeck, Klaus; Bambach, Wolfgang; Ruopp, Gerhard; and Mikley, Frank, 4,434,326, Cl. 179-2.0DP.

Miller, Edward G.: *See*—
Kaczur, Jerry J.; Iacoviello, Steven A.; and Miller, Edward G., 4,434,033, Cl. 204-95.000.

Miller, George P.: *See*—
Fox, Daniel W.; Miller, George P.; and Weech, Marx E., 4,434,074, Cl. 252-628.000.

Miller, George W.: *See*—
Benard, David J.; Pchelkin, Nicholas R.; McDermott, William E.; Ellis, David E.; and Miller, George W., 4,434,492, Cl. 372-59.000.

Miller, Richard F., to Atlantic Richfield Company. Inhibiting polymerization of vinyl aromatic monomers. 4,434,307, Cl. 585-4.000.
Miller, Terrance S.: *See*—
Brown, Jack M.; and Miller, Terrance S., 4,433,570, Cl. 73-12.000.
Milliken Research Corporation: *See*—
Godfrey, Thomas E., 4,433,811, Cl. 239-74.000.
Malone, Thomas J.; and Ragsdale, Mark E., 4,434,067, Cl. 252-88.000.
Mima, Hiroshi, to Murata Kikai Kabushiki Kaisha. Apparatus for splicing spun yarns. 4,433,534, Cl. 57-22.000.
Minalga, Philip F., to Singer Company, The. Spool pin holder for a sewing machine. 4,433,817, Cl. 242-134.000.
Minamishima, Mamoru: *See*—
Kobayashi, Kozo; and Minamishima, Mamoru, 4,434,325, Cl. 381-104.000.
Minas, Hermann: *See*—
Sucrow, Wolfgang; Murawski, Hans-Rudiger; Minas, Hermann; and Stegemeyer, Horst, 4,434,073, Cl. 252-299.620.
Minnesota Mining and Manufacturing Company: *See*—
Licht, Richard R.; Marlor, Alan J.; and Peisert, Joseph C., 4,433,732, Cl. 169-48.000.
Lindsay, Erin J.; and Snyder, Jeffrey T., 4,433,971, Cl. 604-122.000.
Minolta Camera Kabushiki Kaisha: *See*—
Inagaki, Sanji; Takiguchi, Shinji; and Tanaka, Susumu, 4,434,355, Cl. 219-216.000.
Nakatani, Keiji; and Toriumi, Shiro, 4,433,906, Cl. 355-55.000.
Oka, Tateki, 4,434,221, Cl. 430-122.000.
Tanaka, Atsuyuki; Kojima, Hiroaki; Kaieda, Shozo; Kakiuchi, Tokuji; Nishioka, Nobuaki; Tadauchi, Yukio; and Nakagami, Hidekazu, 4,434,503, Cl. 382-48.000.
Miquel, Jean: *See*—
Juguin, Bernard; and Miquel, Jean, 4,434,315, Cl. 585-671.000.
Mircheva, Vera V.: *See*—
Vitkova, Stefana D.; and Mircheva, Vera V., 4,434,030, Cl. 204-43.00T.
Mistyurik, John D., to Monarch Marking Systems, Inc. Printing apparatus. 4,433,624, Cl. 101-314.000.
Mitsubishi Chemical Industries, Ltd.: *See*—
Imahori, Seiichi; Kaneko, Masaharu; Ozawa, Tetsuo; Imazeki, Shuji; Mukoh, Akio; and Sato, Mikio, 4,434,072, Cl. 252-299.100.
Mitsubishi Denki Kabushiki Kaisha: *See*—
Andoh, Tetsuji; Takagi, Shigeji; and Sakamoto, Takeshi, 4,433,472, Cl. 29-596.000.
Asayama, Yoshiaki, 4,433,663, Cl. 123-494.000.
Nagano, Toshio; Kobayashi, Toshiyuki; Koshirakawa, Nobutaka; and Inoue, Takeo, 4,433,724, Cl. 166-60.000.
Ohtomi, Sadayuki, 4,433,755, Cl. 187-20.000.
Mitsui Petrochemicals Industry, Ltd.: *See*—
Kurosaka, Nobuo; Yasuda, Makoto; and Murakami, Tadateru, 4,434,305, Cl. 568-768.000.
Mitsuya, Munehisa: *See*—
Terao, Motoyasu; Horigome, Shinkichi; Mitsuya, Munehisa; Ota, Sakae; and Shigematsu, Kazuo, 4,434,429, Cl. 346-135.100.
Miyagawa, Hiroshi: *See*—
Sakuma, Shinzo; Yanagisawa, Hifumi; Tokuhata, Kazuo; and Miyagawa, Hiroshi, 4,434,331, Cl. 200-144.00B.
Miyake, Hideyuki; and Nakamura, Tosiaki, to Matsushita Electric Industrial Co., Ltd. Coaxial resonator. 4,434,410, Cl. 333-224.000.
Miyakoshi, Shinichi; and Isono, Tokio, to Honda Giken Kogyo Kabushiki Kaisha. Front wheel suspension system for motorcycles. 4,433,850, Cl. 280-277.000.
Miyakoshi, Shinichi; and Isono, Tokio, to Honda Giken Kogyo Kabushiki Kaisha. Front suspension system for motorcycles. 4,433,851, Cl. 280-277.000.
Miyashita, Tsutomu: *See*—
Matsuda, Kazuo; Ohashi, Makoto; Satoh, Yoshio; Miyashita, Tsutomu; and Komenou, Kazunari, 4,434,476, Cl. 365-12.000.
Miyazaki, Masaharu: *See*—
Yorifuji, Yuki; Uyama, Seiichi; Fukutake, Katsuhiko; and Miyazaki, Masaharu, 4,434,363, Cl. 250-214.00B.
Miyazaki, Yoshihisa: *See*—
Takeuchi, Hiroo; Hachiro, Nobuaki; and Miyazaki, Yoshihisa, 4,433,614, Cl. 91-376.00R.
Mizushima, Yoshihiko: *See*—
Yoshikawa, Akira; Takeda, Akitsu; Ochi, Osamu; Hisaki, Tomoko; and Mizushima, Yoshihiko, 4,434,224, Cl. 430-323.000.
Mobil Oil Corporation: *See*—
Audeh, Costandi A.; and Shihabi, David S., 4,434,046, Cl. 208-111.000.
Chang, Clarence D.; and Lang, William H., 4,434,299, Cl. 564-396.000.
Feeney, Frank J., 4,434,271, Cl. 524-575.000.
Gerwick, Ben C., Jr.; and Hatcher, Stephen J., 4,433,941, Cl. 405-211.000.
Mogi, Kenji: *See*—
Sasajima, Junnosuke; Nagai, Hiroshi; Mogi, Kenji; Nojiri, Akio; and Shiina, Naonori, 4,434,251, Cl. 521-75.000.
Mohtai, Tsuneaki: *See*—
Gomi, Yoshiaki; Hirata, Takahiro; Takaoka, Michio; Mohtai, Tsuneaki; and Akashi, Kazuya, 4,434,319, Cl. 174-13.000.
Molina, Jorge W., to Deutsch Fastener Corp. High strength push type fastener. 4,433,459, Cl. 24-613.000.
Monarch Marking Systems, Inc.: *See*—
Mistyurik, John D., 4,433,624, Cl. 101-314.000.
Monsanto Company: *See*—
Sikorski, James A.; and Hoobler, Mary A., 4,433,996, Cl. 71-087.000.
Trivette, Chester D., Jr., 4,434,266, Cl. 524-425.000.
Montagnier, Luc: *See*—
Bisagni, Emile; Ducrocq, Claire; Rivalle, Christian; Tambourin, Pierre; Wendling, Francoise; Civier, Alain; Montagnier, Luc; Chermann, Jean-Claude; Gruest, Jacqueline; and Lidereau, Rosette, 4,434,290, Cl. 546-70.000.
Montague, Herbert R. Power line transient suppression circuit. 4,434,396, Cl. 323-230.000.
Montres Rado S.A.: *See*—
Gogniat, Paul; and Loth, Eric, 4,433,921, Cl. 368-294.000.
Mookherjee, Braja D.: *See*—
Evers, William J.; Mookherjee, Braja D.; Van Ouwerkerk, Anton; and Van Loveren, Augustinus G., 4,434,085, Cl. 252-522.00R.
Hill, Ira D.; Trenkle, Robert W.; Mookherjee, Braja D.; and Wolff, Robin K., 4,434,086, Cl. 252-522.00R.
Moore, Franklin, Jr. Window assembly. 4,433,517, Cl. 52-204.000.
Moore, Joseph L., to Proficient Systems, Inc. Method and apparatus for retrieving objects from the ground. 4,434,011, Cl. 134-6.000.
Moreland, Ernest W. Method and apparatus for use when changing the direction of a well bore. 4,433,738, Cl. 175-61.000.
Mori, Kazuyuki: *See*—
Suzuki, Kouichi; and Mori, Kazuyuki, 4,434,469, Cl. 364-426.000.
Morita, Tominori: *See*—
Tsukamoto, Goro; Kohno, Toshihiko; Yoshino, Koichiro; Morita, Tominori; Ito, Keizo; and Nose, Takashi, 4,434,162, Cl. 424-200.000.
Moriuchi, Tsutomu: *See*—
Kageyama, Hachiro; Moriuchi, Tsutomu; and Oikawa, Yoshiaki, 4,434,063, Cl. 252-25.000.
Morokawa, Shigeru: *See*—
Sekiya, Fukuo; Morokawa, Shigeru; and Iwakura, Ryoji, 4,433,920, Cl. 368-201.000.
Morris, George R.; and Frient, John A. Dual flush toilet mechanism. 4,433,445, Cl. 4-325.000.
Morris, James C. Adjustable extension-cam shim. 4,433,879, Cl. 308-244.000.
Morrison, Charles F., Jr., to Vac-Tec Systems, Inc. Sputtering method and apparatus utilizing improved ion source. 4,434,038, Cl. 204-192.00R.
Morrison, Steven: *See*—
Healey, Daniel J., III; and Morrison, Steven, 4,434,407, Cl. 331-4.000.
Moser, Andreas. Device for driving and positioning towels into concrete slabs. 4,433,936, Cl. 404-88.000.
Motherwell, William B.: *See*—
Barton, Derek H. R.; and Motherwell, William B., 4,434,080, Cl. 502-152.000.
Motion Control, Inc.: *See*—
Benoit, Harold P.; LaPasso, Leonard J.; and McBain, Ian, 4,433,590, Cl. 74-409.000.
Motorola, Inc.: *See*—
Bujalski, Joseph, 4,434,420, Cl. 340-724.000.
Cho, Frederick Y.; and Williams, Dylan F., 4,434,383, Cl. 310-313.00R.
Hoppe, David R., 4,433,919, Cl. 368-120.000.
Levine, Stephen N.; Dabbish, Ezzat A.; and Byrns, John P., 4,434,323, Cl. 178-22.170.
Puhl, Larry C., 4,434,461, Cl. 364-200.000.
Motsch, Roger; Roussel, Francoise; and Lolivier, Germain, to L'Etat Francais, represente par le Ministre des P.T.T. (Centre National d'Etudes des Telecommunications); and Etablissement Public de diffusion dit "Telediffusion de France". System of numerical transmission with adaptative coding, of analogical information sampled and transformed by orthogonal transformation. 4,434,499, Cl. 375-122.000.
Mottate, Tatsuo, to Nippon Thompson Co., Ltd. Rolling bearing for linear motion. 4,433,876, Cl. 308-6.00C.
Mouri, Yasunori: *See*—
Amano, Matsuo; Teranishi, Takao; Mouri, Yasunori; Abe, Osamu; and Sasayama, Takao, 4,433,650, Cl. 123-179.00G.
Mourou, Gerard; Valdmanis, Janis A.; and Williamson, Steven L., to University of Rochester, The. Electron-optical wide band signal measurement system. 4,434,399, Cl. 324-96.000.
Mross, Wolf D.: *See*—
Hoelderich, Wolfgang; Mross, Wolf D.; and Schwarzmann, Matthias, 4,434,314, Cl. 585-640.000.
Muehlenbein, James A., to Novel Products, Inc. Measuring instrument for compressible objects. 4,433,486, Cl. 33-137.00R.
Mueller, Janet M.: *See*—
Wilkinson, Randolph N., III; Sneed, Elmore C.; and Mueller, Janet M., 4,434,136, Cl. 422-263.000.
Muench, Nils L., to General Motors Corporation. Industrial robot having a joint-free arm. 4,433,953, Cl. 414-735.000.
Muhlbacher, Karl. Battery powered electric motor vehicle. 4,433,744, Cl. 180-65.00E.
Mukerjee, Ambar: *See*—
Beck, Heinz; Holtvoigt, Werner; and Mukerjee, Ambar, 4,434,260, Cl. 524-104.000.
Mukoh, Akio: *See*—
Imahori, Seiichi; Kaneko, Masaharu; Ozawa, Tetsuo; Imazeki, Shuji; Mukoh, Akio; and Sato, Mikio, 4,434,072, Cl. 252-299.100.

Mulawski, Walter J., to Sexton Can Company, Inc. Pressure relief device for internally pressurized fluid container. 4,433,791, Cl. 220-89.00A.
Mulhaupt, Bruno, to Escher Wyss Aktiengesellschaft. Centrifugal separator. 4,434,052, Cl. 210-376.000.
Muller, Hans: *See*—
Schmid, Alfred, Jr.; Muller, Hans; and Jaecklin, Alexander P., 4,433,779, Cl. 206-220.000.
Muller, Hans-Jurgen; Schmidt, Karl; Chattopadhayay, Asoke; Heidemanns, Rolf P.; Habel, Georg; and Wittman, Ortwin, to Pierburg GmbH & Co., KG. Fuel supply system. 4,433,662, Cl. 123-438.000.
Muller, Rudolf. Internal combustion motor with turbulence chamber. 4,433,647, Cl. 123-263.000.
Muller, Werner, to Sandoz Ltd. Dibenzazepine derivatives, pharmaceutical compositions containing them, and pharmaceutical methods using them. 4,434,171, Cl. 424-267.000.
Mummenhoff, Peter: *See*—
Probst, Joachim; Kolb, Gunter; Mummenhoff, Peter; and Baumgen, Heinz, 4,434,269, Cl. 524-538.000.
Mundus, Friedhelm; and Achelpohl, Fritz, to Windmoller & Holscher. Apparatus for forming and stacking sections severed from a web of tubular film. 4,433,599, Cl. 83-87.000.
Murakami, Tadashi: *See*—
Suzuki, Yasuo; Nagata, Shuji; Nonaka, Takashiro; and Murakami, Tadashi, 4,433,717, Cl. 164-454.000.
Murakami, Tadateru: *See*—
Kurosaka, Nobuo; Yasuda, Makoto; and Murakami, Tadateru, 4,434,305, Cl. 568-768.000.
Murata Kikai Kabushiki Kaisha: *See*—
Mima, Hiroshi, 4,433,534, Cl. 57-22.000.
Murawski, Hans-Rudiger: *See*—
Sucrow, Wolfgang; Murawski, Hans-Rudiger; Minas, Hermann; and Stegemeyer, Horst, 4,434,073, Cl. 252-299.620.
Murphy, Gregory E.: *See*—
Edwards, Ralston G., Jr.; Walkden, John R. B.; Carstensen, Walter H.; Murphy, Gregory E.; and Lisi, John E., 4,433,776, Cl. 198-779.000.
Murray, Bruce J.: *See*—
Detty, Michael R.; Murray, Bruce J.; and Perlstein, Jerome H., 4,434,098, Cl. 260-239.00R.
Murray, Jack T., to United Centrifugal Pumps. Ring joint machining tool. 4,433,598, Cl. 82-2.00E.
Murtas, Eugenio: *See*—
Carletta, Giuseppe, 4,433,508, Cl. 49-348.000.
Murtha, Timothy P.; and Shioyama, Tad K., to Phillips Petroleum Company. Palladium/heteropolyacid/surfactant catalyst system. 4,434,082, Cl. 502-164.000.
Muscatell, Ralph P. Microwave system for frost protection of fruit trees. 4,434,345, Cl. 219-10.55R.
Musil, Horst E.: *See*—
Jeretin, Stojan; Groke, Karl; and Musil, Horst E., 4,434,160, Cl. 424-180.000.
Myers, John R.: *See*—
Caudy, Don W.; Hackman, Donald J.; Myers, John R.; and Hoffman, Robert T., 4,433,633, Cl. 114-54.000.
Myers, Robert M.: *See*—
Fellman, Robert P.; Hurwitz, Marvin J.; Myers, Robert M.; and Slack, Gerald F., 4,433,958, Cl. 433-199.000.
Mylander, Richard H.: *See*—
Prokop, Josef F.; Coons, Robert R.; and Mylander, Richard H., 4,433,762, Cl. 192-4.00A.
N. F. Industries, Inc.: *See*—
Petriello, John V.; and La Torra, Michael N., 4,434,197, Cl. 427-407.100.
Nadkarni, Ramachandra A.: *See*—
Singhal, Gopal H.; and Nadkarni, Ramachandra A., 4,434,043, Cl. 208-10.000.
Nagai, Hiroshi: *See*—
Sasajima, Junnosuke; Nagai, Hiroshi; Mogi, Kenji; Nojiri, Akio; and Shiina, Naonori, 4,434,251, Cl. 521-75.000.
Nagano, Toshio; Kobayashi, Toshiyuki; Koshirakawa, Nobutaka; and Inoue, Takeo, to Mitsubishi Denki Kabushiki Kaisha. Electrode device for electrically heating underground deposits of hydrocarbons. 4,433,724, Cl. 166-60.000.
Nagata, Shuji: *See*—
Suzuki, Yasuo; Nagata, Shuji; Nonaka, Takashiro; and Murakami, Tadashi, 4,433,717, Cl. 164-454.000.
Nakagami, Hidekazu: *See*—
Tanaka, Atsuyuki; Kojima, Hiroaki; Kaieda, Shozo; Kakiuchi, Tokuji; Nishioka, Nobuaki; Tadauchi, Yukio; and Nakagami, Hidekazu, 4,434,503, Cl. 382-48.000.
Nakahara, Hidetoshi: *See*—
Fujiwara, Ryuhei; Kai, Tomokazu; and Nakahara, Hidetoshi, 4,434,506, Cl. 455-53.000.
Nakajima, Kaoru; Ninomiya, Yoshinobu; and Somezawa, Masashi, to Sony Corporation. Magnetic recording medium. 4,434,210, Cl. 428-447.000.
Nakakita, Kiyomi; and Yamada, Keiichiro, to Kubota Ltd. Helical intake port type suction unit for horizontal single-cylinder direct injection type diesel engine. 4,433,651, Cl. 123-188.00M.
Nakamichi Corporation: *See*—
Kobayashi, Kozo; and Minamishima, Mamoru, 4,434,325, Cl. 381-104.000.
Nakamura, Ken-ichi: *See*—
Nankai, Shiro; Nakamura, Ken-ichi; and Iijima, Takashi, 4,434,229, Cl. 435-174.000.
Nakamura, Norihiko: *See*—
Teramura, Mitsuyoshi; Takimoto, Masatami; Nakamura, Norihiko; Itou, Takaaki; Katou, Takashi; Yasuda, Takeru; and Kitamura, Sunao, 4,434,111, Cl. 261-44.00C.
Nakamura, Sadayuki: *See*—
Kato, Tetsuo; Abeyama, Shozo; Kimura, Atsuyoshi; Sekiya, Shigenobu; and Nakamura, Sadayuki, 4,434,006, Cl. 75-123.00R.
Nakamura, Tosiaki: *See*—
Miyake, Hideyuki; and Nakamura, Tosiaki, 4,434,410, Cl. 333-224.000.
Nakanishi Dental Mfg. Co., Ltd.: *See*—
Nakanishi, Toshimasa, 4,433,957, Cl. 433-105.000.
Nakanishi, Tomohiko: *See*—
Inoguchi, Kazuhiro; Nakanishi, Tomohiko; and Asano, Mitsuru, 4,434,117, Cl. 264-56.000.
Nakanishi, Toshimasa, to Nakanishi Dental Mfg. Co., Ltd. Transmission gear for a dental handpiece. 4,433,957, Cl. 433-105.000.
Nakano, Koji; and Katanaga, Kenji, to Aida Engineering, Ltd. Process for manufacturing universal joint. 4,433,465, Cl. 29-415.000.
Nakata, Shinichi, to Canon Kabushiki Kaisha. Thermal printer. 4,434,354, Cl. 219-216.000.
Nakata, Shuji; Kawaguchi, Yoshio; and Nishimura, Akira, to Nissan Motor Company, Limited. Method and system for determining weld quality in resistance welding. 4,434,351, Cl. 219-117.100.
Nakatani, Keiji; and Toriumi, Shiro, to Minolta Camera Kabushiki Kaisha. Microfilm reader printer equipped with improved exposure amount control arrangement. 4,433,906, Cl. 355-55.000.
Nakayama, Shigeru: *See*—
Haramaki, Toshio; and Nakayama, Shigeru, 4,433,905, Cl. 355-3.0SH.
Nankai, Shiro; Nakamura, Ken-ichi; and Iijima, Takashi, to Matsushita Electric Industrial Co., Ltd. Enzyme immobilization with an immobilizing reagent in vapor phase. 4,434,229, Cl. 435-174.000.
Naoetsu Electronics Co., Ltd.: *See*—
Katagiri, Kiyoo; and Honda, Mitsuo, 4,433,510, Cl. 51-165.00R.
Narisawa, Shizuo; Taira, Yoshito; Yoshii, Yuuji; and Kondou, Tomizou, to Sumitomo Chemical Company, Limited. Cement composition. 4,434,257, Cl. 524-5.000.
Naruse, Mikio: *See*—
Hamabe, Takeshi; Wada, Hidekazu; Naruse, Mikio; and Nishimori, Toshiyuki, 4,434,452, Cl. 361-304.000.
Nasiri, Saeed, to National Semiconductor Corporation. Fiber optic assembly for coupling an optical fiber and a light source. 4,433,898, Cl. 350-96.170.
Naslund, Leif: *See*—
Ohrnell, Hakan; and Naslund, Leif, 4,433,586, Cl. 73-862.480.
Nasu, Mitsuo, to Olympus Optical Company Limited. Microphone device built in a tape recorder. 4,434,329, Cl. 179-121.00R.
Nathenson, Richard D.: *See*—
Patel, Mukunk R.; and Nathenson, Richard D., 4,434,382, Cl. 310-51.000.
National Institute for Researches in Inorganic Materials: *See*—
Kamo, Mutsukazu; Matsumoto, Seiichiro; Sato, Yoichiro; and Setaka, Nobuo, 4,434,188, Cl. 427-39.000.
National Semiconductor Corporation: *See*—
Nasiri, Saeed, 4,433,898, Cl. 350-96.170.
National Starch and Chemical Corporation: *See*—
Gold, Samuel; Tracton, Arthur A.; and Rosenski, Josephine M., 4,434,259, Cl. 524-31.000.
Natsui, Ken-ichi; and Koyanagi, Osamu, to Hitachi, Ltd. Compressed-gas circuit interrupter with a heater. 4,434,335, Cl. 200-148.00E.
NCR Corporation: *See*—
Osmera, Miroslav S.; Brooks, Ralf M.; and Kim, Sung-Soon, 4,433,902, Cl. 354-10.000.
Neefe, Charles W. Spin casting lenses having reduced spherical aberration. 4,434,113, Cl. 264-2.100.
Neese, James A., to Sparton Corporation. Synthetic horn projector with metal insert. 4,433,750, Cl. 181-179.000.
Neisius, Karl-Heinz: *See*—
Eichler, Jurgen; Herz, Claus; and Neisius, Karl-Heinz, 4,434,035, Cl. 204-159.130.
Nelson, Conrad E., to General Electric Company. Remote load current sensor. 4,434,397, Cl. 324-58.00R.
Nelson, Paul M., to FMC Corporation. Method for preventing decay of fruit. 4,434,185, Cl. 426-308.000.
Neumann, Solomon, to Easy-Do Products Limited. Process for making water activatable tiles. 4,434,192, Cl. 427-282.000.
Nevitt, Thomas D.: *See*—
Hensley, Albert L., Jr.; Nevitt, Thomas D.; and Tait, A. Martin, 4,434,047, Cl. 208-111.000.
Newman, Robert J.: *See*—
Dean, Robert R.; Mauleon, Jean L.; and Newman, Robert J., 4,434,049, Cl. 208-153.000.
Ng, Charles S.: *See*—
Dailey, Jack R.; Kuntzleman, Harry C.; Ng, Charles S.; and Pike, John W., 4,434,432, Cl. 346-154.000.
NHK Spring Co., Ltd.: *See*—
Tabe, Takayuki; and Shinbori, Takeyoshi, 4,433,833, Cl. 267-18.000.
Nichols, Lawrence J.: *See*—
MacMaster, George H.; and Nichols, Lawrence J., 4,434,387, Cl. 315-39.300.
Nicholson, Charles B., to Albany International Corp. Two piece screen filter. 4,434,055, Cl. 210-489.000.

Nickerson, Earl W.: *See*—
DeGraw, Kenneth J.; Wilcockson, Brian; Nickerson, Earl W.; Bocchini, William R.; Bogossian, Armen; and Proios, Steve, 4,433,443, Cl. 4-317.000.
Nicola, Robert J.: *See*—
Marino, Vincent E.; Nicola, Robert J.; Maier, Karl; and Stockinger, Richard W., 4,433,890, Cl. 339-97.00C.
Nielsen, Arnold T.: *See*—
DeFusco, Albert A., Jr.; Nielsen, Arnold T.; and Atkins, Ronald L., 4,434,304, Cl. 568-710.000.
Nihon Kaiheiki Kogyo Kabushiki Kaisha: *See*—
Ohashi, Shigeo, 4,434,339, Cl. 200-295.000.
Nihon Tokushu Noyaku Seizo K.K.: *See*—
Saito, Junichi; and Kume, Toyohiko, 4,434,303, Cl. 568-686.000.
Niles, Aaron F.; and Johnson, Dennis P., to Rayovac Corporation. Lithium anode. 4,434,213, Cl. 429-3.000.
Nimry, Baker N.: *See*—
Johnson, Donald A.; and Nimry, Baker N., 4,434,059, Cl. 210-701.000.
Ninomiya, Yoshinobu: *See*—
Nakajima, Kaoru; Ninomiya, Yoshinobu; and Somezawa, Masashi, 4,434,210, Cl. 428-447.000.
Nippon Electric Co., Ltd.: *See*—
Arakawa, Takeshi; and Ikeda, Hiroki, 4,434,502, Cl. 382-41.000.
Fujiwara, Ryuhei; Kai, Tomokazu; and Nakahara, Hidetoshi, 4,434,506, Cl. 455-53.000.
Kawamata, Ikuo, 4,433,468, Cl. 29-571.000.
Sakuma, Isamu; Nishida, Katsuhiko; Kawano, Hideo; Ueno, Masayasu; Matsumoto, Yoshishige; Matsumoto, Shohei; and Furuse, Takao, 4,434,491, Cl. 372-48.000.
Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Kondo, Masao, 4,434,340, Cl. 200-332.000.
Nippon Kogaku K.K.: *See*—
Kojima, Masaaki; Suzuki, Takayuki; and Abe, Hiromichi, 4,433,897, Cl. 350-252.000.
Takahashi, Yosuke; Akasaka, Hideki; Kasui, Toshikatsu; Niwa, Tatsuo; and Sukegawa, Tsuneo, 4,433,901, Cl. 350-357.000.
Nippon Kokan Kabushiki Kaisha: *See*—
Nomura, Hirokazu; Sugitani, Yuji; and Suzuki, Yasuo, 4,434,352, Cl. 219-125.120.
Nippon Petrochemicals Co., Ltd: *See*—
Okada, Tokio; Kojima, Shigezo; Tani, Haruhisa; Kurihara, Kazuhiko; and Yazawa, Hirosi, 4,434,128, Cl. 264-560.000.
Nippon Soken, Inc.: *See*—
Abe, Seiko; Igashira, Toshihiko; Kawai, Hisasi; Ina, Toshikazu; and Tokoro, Masayoshi, 4,433,665, Cl. 123-552.000.
Inoguchi, Kazuhiro; Nakanishi, Tomohiko; and Asano, Mitsuru, 4,434,117, Cl. 264-56.000.
Nippon Steel Corporation: *See*—
Suzuki, Yasuo; Nagata, Shuji; Nonaka, Takashiro; and Murakami, Tadashi, 4,433,717, Cl. 164-454.000.
Nippon Telegraph & Telephone Public Corporation: *See*—
Isobe, Minoru; Kikuchi, Hiroshi; Teshima, Minoru; Kodama, Tadasi; and Iwama, Mitsuo, 4,433,926, Cl. 400-124.000.
Yoshikawa, Akira; Takeda, Akitsu; Ochi, Osamu; Hisaki, Tomoko; and Mizushima, Yoshihiko, 4,434,224, Cl. 430-323.000.
Nippon Thompson Co., Ltd.: *See*—
Mottate, Tatsuo, 4,433,876, Cl. 308-6.00C.
Nippondenso Co., Ltd.: *See*—
Hattori, Yoshiyuki; Matsui, Kazuma; and Kinbara, Hiroji, 4,433,965, Cl. 474-201.000.
Nisenson, Jules: *See*—
Rude, Edward T.; Nisenson, Jules; and Waine, Martin, 4,433,765, Cl. 192-41.00S.
Nishida, Katsuhiko: *See*—
Sakuma, Isamu; Nishida, Katsuhiko; Kawano, Hideo; Ueno, Masayasu; Matsumoto, Yoshishige; Matsumoto, Shohei; and Furuse, Takao, 4,434,491, Cl. 372-48.000.
Nishimori, Toshiyuki: *See*—
Hamabe, Takeshi; Wada, Hidekazu; Naruse, Mikio; and Nishimori, Toshiyuki, 4,434,452, Cl. 361-304.000.
Nishimura, Akira: *See*—
Nakata, Shuji; Kawaguchi, Yoshio; and Nishimura, Akira, 4,434,351, Cl. 219-117.100.
Nishimura, Katsuo; and Sekiya, Fukuo, to Citizen Watch Company Limited. Analog display electronic timepiece with multi-mode display capability. 4,433,918, Cl. 368-74.000.
Nishimura, Sanji: *See*—
Watanabe, Morio; and Nishimura, Sanji, 4,434,002, Cl. 75-0.5AA.
Nishioka, Nobuaki: *See*—
Tanaka, Atsuyuki; Kojima, Hiroaki; Kaieda, Shozo; Kakiuchi, Tokuji; Nishioka, Nobuaki; Tadauchi, Yukio; and Nakagami, Hidekazu, 4,434,503, Cl. 382-48.000.
Nishizawa, Jun-ichi, to Zaidan Hojin Handotai Kenkyu Shinkokai. Enhancement mode JFET dynamic memory. 4,434,433, Cl. 357-22.000.
Nissan Chemical Industries, Ltd.: *See*—
Tsuchiya, Shuji; Ikeda, Hisao; and Suzuki, Kenji, 4,434,104, Cl. 260-456.00P.
Nissan Motor Company, Limited: *See*—
Chikaraishi, Takayo, 4,433,507, Cl. 49-213.000.
Hagiwara, Taro, 4,433,866, Cl. 296-76.000.
Ichinose, Hisao, 4,433,759, Cl. 188-282.000.
Ishikawa, Yasuki; Endo, Hiroshi; Sone, Masazumi; and Imai, Iwao, 4,433,669, Cl. 123-620.000.
Masaki, Kenji; and Yasuhara, Seishi, 4,433,666, Cl. 123-569.000.
Nakata, Shuji; Kawaguchi, Yoshio; and Nishimura, Akira, 4,434,351, Cl. 219-117.100.
Shimura, Atsuo, 4,433,542, Cl. 60-299.000.
Suzuki, Kouichi; and Mori, Kazuyuki, 4,434,469, Cl. 364-426.000.
Takahashi, Takao; Ohnishi, Kimimasa; and Wakai, Sinzi, 4,433,706, Cl. 139-435.000.
Nissin Kogyo Kabushiki Kaisha: *See*—
Takeuchi, Hiroo; Hachiro, Nobuaki; and Miyazaki, Yoshihisa, 4,433,614, Cl. 91-376.00R.
Niwa, Tatsuo: *See*—
Takahashi, Yosuke; Akasaka, Hideki; Kasui, Toshikatsu; Niwa, Tatsuo; and Sukegawa, Tsuneo, 4,433,901, Cl. 350-357.000.
NL Industries, Inc.: *See*—
Driver, Gary R.; and Herman, Richard J., 4,433,859, Cl. 285-34.000.
Mardis, Wilbur S.; and Finlayson, Claude M., 4,434,075, Cl. 252-315.200.
Mardis, Wilbur S.; and Finlayson, Claude M., 4,434,076, Cl. 252-315.200.
Noguchi, Masaru: *See*—
Yokota, Masazi; and Noguchi, Masaru, 4,433,893, Cl. 350-3.610.
Nojiri, Akio: *See*—
Sasajima, Junnosuke; Nagai, Hiroshi; Mogi, Kenji; Nojiri, Akio; and Shiina, Naonori, 4,434,251, Cl. 521-75.000.
Nomura, Hirokazu; Sugitani, Yuji; and Suzuki, Yasuo, to Nippon Kokan Kabushiki Kaisha. Arc welding method for automatically reversing a welding torch in the width direction of the groove at a set position. 4,434,352, Cl. 219-125.120.
Nonaka, Takashiro: *See*—
Suzuki, Yasuo; Nagata, Shuji; Nonaka, Takashiro; and Murakami, Tadashi, 4,433,717, Cl. 164-454.000.
Nooijen, Godefridus A. H.: *See*—
van de Leemput, Lambertus J. M. A.; and Nooijen, Godefridus A. H., 4,434,083, Cl. 502-154.000.
Nord, Keith W., to Ex-Cell-O Corporation. Packaging machine. 4,433,526, Cl. 53-244.000.
Nordica S.p.A.: *See*—
Baggio, Giorgio, 4,433,456, Cl. 24-68.0SK.
Nordstrom, Mark B.: *See*—
Winter, Roger D.; Workman, David E.; and Nordstrom, Mark B., 4,433,761, Cl. 190-109.000.
Norlin Industries, Inc.: *See*—
Hall, George R.; Hall, Robert J.; and Cookerly, Jack C., 4,433,601, Cl. 84-1.030.
Norris, James R.; and Picard, Harrison R., to United Technologies Corporation. Means for controlling air scavenge pressure in the bearing compartment of gas turbines. 4,433,539, Cl. 60-39.080.
North American Philips Corporation: *See*—
Levine, Joshua L., 4,433,585, Cl. 73-862.340.
North American Specialties Corp.: *See*—
Seidler, Jack, 4,433,892, Cl. 339-258.00P.
Norwood, Joseph E., Sr. Automotive oil filter precharging arrangement. 4,433,656, Cl. 123-196.00A.
Nose, Takashi: *See*—
Tsukamoto, Goro; Kohno, Toshihiko; Yoshino, Koichiro; Morita, Tominori; Ito, Keizo; and Nose, Takashi, 4,434,162, Cl. 424-200.000.
Nostam, Inc.: *See*—
Matson, John S., 4,433,524, Cl. 52-665.000.
Novel Products, Inc.: *See*—
Muehlenbein, James A., 4,433,486, Cl. 33-137.00R.
NOVUM - Novita in Elettrodomestica Srl: *See*—
Parisi, Sebastiano, 4,433,451, Cl. 15-321.000.
Nyitrai, Jozsef: *See*—
Lempert, Karoly; Harsanyi, Kalman; Doleschall, Gabor; Hornyak, Gyula; Nyitrai, Jozsef; Zauer, Karoly; Fetter, Jozsef; Simig, Gyula; Gombos nee Visky, Zsuzsanna; and Szalai nee Barta, Gizella, 4,434,099, Cl. 260-239.00A.
Ochi, Osamu: *See*—
Yoshikawa, Akira; Takeda, Akitsu; Ochi, Osamu; Hisaki, Tomoko; and Mizushima, Yoshihiko, 4,434,224, Cl. 430-323.000.
Odernheimer, Bernhard; Kremer, Johannes H.; and Kranich, Klaus O., to Bruker-Franzen Analytik GmbH. Input head of a measuring or identification system for chemical agents. 4,433,982, Cl. 55-158.000.
Offenstadt, Eric, to Sercati S.A.R.L. Motorcycle with improved rear suspension. 4,433,747, Cl. 180-227.000.
Officine Savio S.p.A.: *See*—
D'Agnolo, Armando, 4,433,815, Cl. 242-118.000.
Ogata, Shoji: *See*—
Satoh, Tetsuo; Ohgami, Masaaki; and Ogata, Shoji, 4,433,748, Cl. 180-247.000.
Ogden Electronics Ltd.: *See*—
Steel, James, 4,433,746, Cl. 180-171.000.
Ogiso, Akira: *See*—
Kobayashi, Shinsaku; and Ogiso, Akira, 4,434,179, Cl. 424-308.000.
Ogura, Mitsugi: *See*—
Sawada, Shizuo; Ogura, Mitsugi; and Endo, Norio, 4,433,911, Cl. 355-125.000.
O'Hare, James A.: *See*—
Gaglione, Stanley; and O'Hare, James A., 4,434,426, Cl. 343-372.000.
Ohashi, Hiroyuki: *See*—
Kurihara, Shigeru; and Ohashi, Hiroyuki, 4,434,029, Cl. 203-42.000.
Ohashi, Makoto: *See*—
Matsuda, Kazuo; Ohashi, Makoto; Satoh, Yoshio; Miyashita, Tsutomu; and Komenou, Kazunari, 4,434,476, Cl. 365-12.000.

Ohashi, Shigeo, to Nihon Kaiheiki Kogyo Kabushiki Kaisha. Mounting frame equipped wth decorative plate for mounting switch or the like. 4,434,339, Cl. 200-295.000.

Ohgami, Masaaki: *See*—
Satoh, Tetsuo; Ohgami, Masaaki; and Ogata, Shoji, 4,433,748, Cl. 180-247.000.

Ohio State University Research Foundation, The: *See*—
Olsen, Richard G., 4,434,157, Cl. 424-89.000.

Ohkubo, Tetsuo; Arai, Yoshio; and Kataoka, Hiroyuki, to Fuji Xerox Co., Ltd. Multilevel image printing device. 4,434,431, Cl. 346-154.000.

Ohmori, Taiji; Kasahara, Toshio; and Uchida, Yoshiaki, to Honda Giken Kogyo Kabushiki Kaisha. Control circuit for vehicle level adjusting apparatus. 4,433,743, Cl. 180-41.000.

Ohmori, Taiji, to Honda Giken Kogyo Kabushiki Kaisha. Control circuit for a vehicle leveling system. 4,433,849, Cl. 280-6.00R.

Ohnishi, Kimimasa: *See*—
Takahashi, Takao; Ohnishi, Kimimasa; and Wakai, Sinzi, 4,433,706, Cl. 139-435.000.

Ohrnell, Hakan; and Naslund, Leif, to Handelsbolaget Ohrnell-Teknik. Electronic cable load gauge. 4,433,586, Cl. 73-862.480.

Ohta, Mitsuru: *See*—
Sasaki, Tohru; Ohta, Mitsuru; Terasaki, Syuuzi; and Kakizaki, Syozo, 4,434,209, Cl. 428-416.000.

Ohta, Takatoshi: *See*—
Kohira, Takeo; Taguchi, Takao; Sugiura, Takeo; and Ohta, Takatoshi, 4,434,223, Cl. 430-273.000.

Ohtaka, Shoichi: *See*—
Amano, Katsuhisa; Kumagai, Tadashi; Masaki, Akio; Shimada, Shinichi; Suzuki, Takeshi; and Ohtaka, Shoichi, 4,433,541, Cl. 60-293.000.

Ohtomi, Sadayuki, to Mitsubishi Denki Kabushiki Kaisha. Elevator apparatus. 4,433,755, Cl. 187-20.000.

Oikawa, Yoshiaki: *See*—
Kageyama, Hachiro; Moriuchi, Tsutomu; and Oikawa, Yoshiaki, 4,434,063, Cl. 252-25.000.

Oka, Tateki, to Minolta Camera Kabushiki Kaisha. Toner concentration detection by measuring current created by transfer of carrier component to non-image areas of image support surface. 4,434,221, Cl. 430-122.000.

Okada, Tokio; Kojima, Shigezo; Tani, Haruhisa; Kurihara, Kazuhiko; and Yazawa, Hirosi, to Nippon Petrochemicals Co., Ltd; and Polymer Processing Research Institute, Ltd. Method and apparatus for stretching thermoplastic polymer films. 4,434,128, Cl. 264-560.000.

Okamoto Chemical Industry Co., Ltd.: *See*—
Kohira, Takeo; Taguchi, Takao; Sugiura, Takeo; and Ohta, Takatoshi, 4,434,223, Cl. 430-273.000.

O'Kane, James C.: *See*—
Taylor, Edward F.; and O'Kane, James C., 4,433,858, Cl. 280-807.000.

Okano, Shuji: *See*—
Fujii, Shigeo; Ikeda, Tokuzo; Mikami, Takashi; and Okano, Shuji, 4,434,205, Cl. 428-218.000.

Oki Electric Industry Co., Ltd.: *See*—
Isobe, Minoru; Kikuchi, Hiroshi; Teshima, Minoru; Kodama, Tadasi; and Iwama, Mitsuo, 4,433,926, Cl. 400-124.000.

Old, Julian C., to Marconi Company Limited, The. Side lobe canceller for radar systems. 4,434,424, Cl. 343-381.000.

Oldakowski, Chester C.: *See*—
Bhattacharya, Somnath; Hu, Shih-Ming; Koopman, Nicholas G.; and Oldakowski, Chester C., 4,434,434, Cl. 357-71.000.

Olin Corporation: *See*—
Cline, Warren K.; and Owens, William F., 4,433,697, Cl. 131-365.000.
Kaczur, Jerry J.; Iacoviello, Steven A.; and Miller, Edward G., 4,434,033, Cl. 204-95.000.
Kelly, Pilar P.; and Justice, David D., 4,434,041, Cl. 204-296.000.
Saleh, Yousef; Breedis, John F.; and Crane, Jacob, 4,434,016, Cl. 148-12.70C.

Olivieri, Icaro, to Icaro Olivieri & C. S.p.A. Quick-fastener for roller skates. 4,433,458, Cl. 24-191.000.

Olschewski, Armin; Brandenstein, Manfred; Walter, Lothar; and Kunkel, Heinrich, to SKF Kugellagerfabriken GmbH. Clutch throw-out. 4,433,768, Cl. 192-98.000.

Olschewski, Armin: *See*—
Walter, Lothar; Brandenstein, Manfred; Ernst, Horst M.; and Olschewski, Armin, 4,433,875, Cl. 308-6.00R.

Olsen, Richard G., to Ohio State University Research Foundation, The. Method of recovering cell antigen and preparation of feline leukemia vaccine therefrom. 4,434,157, Cl. 424-89.000.

Olszewski, Walter J., to Union Carbide Corporation. Process to recover argon from oxygen-only air separation plant. 4,433,990, Cl. 62-22.000.

Olympus Optical Co., Ltd.: *See*—
Baba, Kazuo, 4,433,692, Cl. 128-660.000.
Konoshima, Katunaga, 4,433,675, Cl. 128-6.000.
Nasu, Mitsuo, 4,434,329, Cl. 179-121.00R.
Osanai, Akira, 4,434,447, Cl. 360-137.000.
Sato, Masaaki, 4,434,444, Cl. 360-96.500.
Tabara, Takashi, 4,434,232, Cl. 435-288.000.

Omi, Kokichi; and Kuroda, Yasuo, to Canon Kabushiki Kaisha. Device for setting exposure quantity. 4,433,908, Cl. 355-68.000.

O'Neil, John B., to Exxon Research & Engineering Co. Spiral wrapped synthetic twine and method of manufacturing same. 4,433,536, Cl. 57-233.000.

Ono, Saichi: *See*—
Kawasaki, Takao; Osaka, Yoshiaki; Komatsu, Katsumi; Yamaguchi, Yukiharu; and Ono, Saichi, 4,434,172, Cl. 424-270.000.

Optical Coating Laboratory, Inc.: *See*—
Ash, Gary S., 4,434,010, Cl. 106-291.000.

Ornato, Giorgio: *See*—
Giobbio, Vincenzo; Ornato, Giorgio; Buracchi, Livio; and Mangia, Alberto, 4,434,097, Cl. 260-112.50R.

Ortho Diagnostic Systems, Inc.: *See*—
Azad, A. R. M.; Kirchanski, Stefan J.; and Brown, Michael C., 4,434,150, Cl. 424-1.100.
Zolton, Raymond P.; Kaplan, Paul M.; and Padvelskis, John V., 4,434,093, Cl. 260-112.00B.

Osaka Taiyu Co., Ltd.: *See*—
Fujita, Hiromu, 4,433,954, Cl. 414-757.000.

Osaka, Yoshiaki: *See*—
Kawasaki, Takao; Osaka, Yoshiaki; Komatsu, Katsumi; Yamaguchi, Yukiharu; and Ono, Saichi, 4,434,172, Cl. 424-270.000.

Osanai, Akira, to Olympus Optical Co., Ltd. Cassette tape recorder. 4,434,447, Cl. 360-137.000.

Osmera, Miroslav S.; Brooks, Ralf M.; and Kim, Sung-Soon, to NCR Corporation. Projection printer. 4,433,902, Cl. 354-10.000.

Osuna-Diaz, J. M. Two-stage filter for injection molding machine. 4,434,053, Cl. 210-446.000.

Oswald, Alexis A.; Huang, Helen; Huang, John; and Valint, Paul, Jr., to Exxon Research and Engineering Co. Oil displacement enhanced by lyotropic liquid crystals in highly saline media. 4,434,062, Cl. 252-8.55D.

Ota, Naoto: *See*—
Kobari, Katsuo; Ishida, Hiroshi; and Ota, Naoto, 4,434,393, Cl. 318-757.000.

Ota, Sakae: *See*—
Terao, Motoyasu; Horigome, Shinkichi; Mitsuya, Munehisa; Ota, Sakae; and Shigematsu, Kazuo, 4,434,429, Cl. 346-135.100.

Otis Engineering Corporation: *See*—
Raulins, George M.; and Grimmer, George G., 4,433,862, Cl. 285-350.000.

Ott, Granville E., to Texas Instruments Incorporated. Frequency domain digital encoding technique for musical signals. 4,433,604, Cl. 84-1.190.

Ott, Paul W.; Engebretson, Harold J.; LaHue, Philip M.; and Van Steenwyk, Brett H., to Applied Technologies Associates. Azimuth determination for vector sensor tools. 4,433,491, Cl. 33-302.000.

Owens-Corning Fiberglas Corporation: *See*—
Charon, Clarence W.; and Reid, Kenneth E., 4,434,255, Cl. 523-209.000.
Gilleland, Frank W., 4,433,674, Cl. 126-450.000.

Owens, Edward W., to Top-Seal Corporation. Pouring fitment and closure assembly. 4,433,800, Cl. 222-547.000.

Owens-Illinois, Inc.: *See*—
Edwards, Ralston G., Jr.; Walkden, John R. B.; Carstensen, Walter H.; Murphy, Gregory E.; and Lisi, John E., 4,433,776, Cl. 198-779.000.
Riggs, Darius O.; and Sorbie, Thomas B., 4,433,785, Cl. 209-531.000.

Owens, William F.: *See*—
Cline, Warren K.; and Owens, William F., 4,433,697, Cl. 131-365.000.

Oyama, Yoshio, to Yoshida Kogyo K. K. Method of and apparatus for attaching bottom stops to a slide fastener chain. 4,433,478, Cl. 29-767.000.

Ozawa, Tetsuo: *See*—
Imahori, Seiichi; Kaneko, Masaharu; Ozawa, Tetsuo; Imazeki, Shuji; Mukoh, Akio; and Sato, Mikio, 4,434,072, Cl. 252-299.100.

Padilla, Isaac F. Direct fired glycol regenerator with vertical flues. 4,434,034, Cl. 202-153.000.

Padvelskis, John V.: *See*—
Zolton, Raymond P.; Kaplan, Paul M.; and Padvelskis, John V., 4,434,093, Cl. 260-112.00B.

Pallos, Ferenc M., to Stauffer Chemical Company. N-Acylsulfonamide herbicidal antidotes. 4,433,997, Cl. 71-92.000.

Pallos, Ferenc M.: *See*—
Mahoney, Martin D.; Gaughan, Edmund J.; Pallos, Ferenc M.; and Lam, Hsiao-Ling, 4,434,000, Cl. 71-103.000.

Palmquist, Steven R.; Chapman, David D.; and Hoeren, Gerd H., to Tektronix, Inc. Logic analyzer for a multiplexed digital bus. 4,434,488, Cl. 371-15.000.

Panas, William R.: *See*—
Jarosz, John M.; and Panas, William R., 4,434,415, Cl. 337-186.000.

Pao Chen, Paul C. Method and apparatus for forming subterranean concrete piles. 4,433,943, Cl. 405-241.000.

Papa, Anthony J., to Union Carbide Corporation. Production of low color refined isophorone. 4,434,301, Cl. 568-366.000.

Pape, Gebhard: *See*—
Brandenstein, Manfred; Hans, Ruiger; Horling, Peter; Hetterich, Hermann; Pape, Gebhard; and Gossmann, Willi, 4,433,932, Cl. 403-261.000.

Papuchon, Michel: *See*—
Puech, Claude; Papuchon, Michel; and Arditty, Herve, 4,433,895, Cl. 350-96.130.

Paradyne Corporation: *See*—
Ballentine, Howard K., Jr., 4,434,378, Cl. 307-350.000.

Parenti, Mark A.: *See*—
Rubinson, Barry L.; Parenti, Mark A.; Lary, Richard F.; and Gardner, Edward A., 4,434,487, Cl. 371-10.000.

Parisi, Sebastiano, to NOVUM - Novita in Elettrodomestica Srl. Device for cleaning surfaces. 4,433,451, Cl. 15-321.000.
Parker, Donald L.; and Hogg, Hubert, to General Motors Corporation. Pressure modified brake actuating pressure proportioner. 4,433,872, Cl. 303-22.00A.
Parker, Donald L.: *See—*
Warwick, Edward H.; and Parker, Donald L., 4,433,757, Cl. 188-1.110.
Parker, Kenneth O., to Garrett Corporation, The. Heat exchanger method and apparatus. 4,433,723, Cl. 165-166.000.
Parker, Russell C.: *See—*
Swartz, Harold L.; Atkeisson, Randal A.; Carter, Rodney A.; and Parker, Russell C., 4,434,391, Cl. 318-662.000.
Parsons, James H., Jr.; Hardy-The McLain, Philippe; and Tringali, Dominick, to Shakespeare Company, The. Connector for fiber reinforced plastic tension rods. 4,433,933, Cl. 403-268.000.
Particle Data, Inc.: *See—*
Berg, Robert H.; and Karuhn, Richard F., 4,434,398, Cl. 324-71.400.
Pascarella, Vincent J.: *See—*
McGary, Charles W., Jr.; Pascarella, Vincent J.; Taller, Robert A.; Rhodes, Delmer R.; Anglin, Paul E.; and Daugherty, Charles W., 4,434,126, Cl. 264-303.000.
Patel, Mukunk R.; and Nathenson, Richard D., to Electric Power Research Institute, Inc. Viscoelastic support for dynamoelectric machines. 4,434,382, Cl. 310-51.000.
Paulik, John R.: *See—*
Kulpa, Walter J.; and Paulik, John R., 4,433,836, Cl. 271-3.100.
Pauling, Horst: *See—*
Hostettler, Hans U.; and Pauling, Horst, 4,434,178, Cl. 424-287.000.
Pavey, Victor J.: *See—*
Doroszkowsky, Andrew; and Pavey, Victor J., 4,434,268, Cl. 524-520.000.
Payne, Rex E., Jr.; and Hoffman, Ronald R., to Dawn Designs, Inc. Baby walker. 4,433,869, Cl. 297-5.000.
PBS Associates: *See—*
Schrepel, William J., 4,434,509, Cl. 455-343.000.
Pchelkin, Nicholas R.: *See—*
Benard, David J.; Pchelkin, Nicholas R.; McDermott, William E.; Ellis, David E.; and Miller, George W., 4,434,492, Cl. 372-59.000.
Pearson, Mark. Drink coasters. 4,433,823, Cl. 248-346.100.
Peisert, Joseph C.: *See—*
Licht, Richard R.; Marlor, Alan J.; and Peisert, Joseph C., 4,433,732, Cl. 169-48.000.
Pelavin, Joseph Y., to CPG Products Corp. Deformable lightweight luggage. 4,433,760, Cl. 190-115.000.
Pelletier, Jean-Marc; and Dion, Yvon, to Hydro-Quebec. Electrical circuit breaker module. 4,434,413, Cl. 337-71.000.
Pennwalt Corporation: *See—*
McGraw, Isaac R., 4,434,183, Cl. 424-340.000.
Sprout, Oliver S., Jr., 4,434,114, Cl. 264-22.000.
Penrod, John K.: *See—*
Carver, LeRoy J.; and Penrod, John K., 4,434,388, Cl. 315-307.000.
Penty, Robert A.: *See—*
Sarin, Vinod K.; Penty, Robert A.; and Buljan, Sergej-Tomislav, 4,433,979, Cl. 51-307.000.
Perlstein, Jerome H.: *See—*
Detty, Michael R.; Murray, Bruce J.; and Perlstein, Jerome H., 4,434,098, Cl. 260-239.00R.
Perry, William H.; Stewart, David C.; and Waterworth, Geoffrey, to General Motors Corporation. Roof rail molding member. 4,433,867, Cl. 296-146.000.
Petersen, Carl T., III: *See—*
Koch, George R.; and Petersen, Carl T., III, 4,433,951, Cl. 414-217.000.
Petriello, John V.; and La Torra, Michael N., to N. F. Industries, Inc. Non-stick energy-modifying cooking liner and method of making same. 4,434,197, Cl. 427-407.100.
Pettit, John W.: *See—*
Craig, Timothy P.; Pettit, John W.; and Timperman, Michael R., 4,434,356, Cl. 219-216.000.
Pfeiffer, Gene F.: *See—*
Cherry, Raymond L.; Pfeiffer, Gene F.; and Maes, Randell P., 4,433,719, Cl. 165-26.000.
Pfeiffer, Wilfried, to U.S. Philips Corporation. X-Ray film cassette. 4,434,501, Cl. 378-187.000.
Pfizer Inc.: *See—*
Lombardino, Joseph G., 4,434,163, Cl. 424-246.000.
Lombardino, Joseph G., 4,434,164, Cl. 424-246.000.
Welch, Willard M., Jr., 4,434,173, Cl. 424-271.000.
Philip Morris Incorporated: *See—*
Adams, John M., 4,433,696, Cl. 131-336.000.
Phillips, D. Colin: *See—*
Down, Michael G.; Phillips, D. Colin; and Emmerich, Werner S., 4,434,133, Cl. 376-323.000.
Phillips, George C.: *See—*
Darrow, Russell E.; Funari, Joseph; Kotrch, George S.; and Phillips, George C., 4,434,134, Cl. 419-5.000.
Phillips Petroleum Company: *See—*
Blackwell, Jennings P., 4,434,263, Cl. 524-322.000.
Kolts, John H., 4,434,079, Cl. 252-412.000.
Martin, Joel L., 4,434,243, Cl. 502-171.000.
McDaniel, Max P.; and Welch, M. Bruce, 4,434,280, Cl. 526-106.000.
Murtha, Timothy P.; and Shioyama, Tad K., 4,434,082, Cl. 502-164.000.
Reed, Jerry O., 4,434,122, Cl. 264-211.000.
Piaggio & C. S.p.A.: *See—*
Benedetti, Carlo, 4,433,473, Cl. 29-598.000.
Picard, Harrison R.: *See—*
Norris, James R.; and Picard, Harrison R., 4,433,539, Cl. 60-39.080.
Picard, Robert J.: *See—*
Antisdel, Gerald L.; and Picard, Robert J., 4,433,484, Cl. 30-90.400.
Pierburg GmbH & Co., KG: *See—*
Muller, Hans-Jurgen; Schmidt, Karl; Chattopadhayay, Asoke; Heidemanns, Rolf P.; Habel, Georg; and Wittman, Ortwin, 4,433,662, Cl. 123-438.000.
Pierrel S.p.A.: *See—*
Giobbio, Vincenzo; Ornato, Giorgio; Buracchi, Livio; and Mangia, Alberto, 4,434,097, Cl. 260-112.50R.
Pietzsch, Herbert; Lachner, Walter; Hofmann, Karlheinz; Potzsch, Erich; and Esser, Fred. Contact electrode for melting and heating furnaces with DC plasma heating. 4,434,494, Cl. 373-18.000.
Pike, John W.: *See—*
Dailey, Jack R.; Kuntzleman, Harry C.; Ng, Charles S.; and Pike, John W., 4,434,432, Cl. 346-154.000.
Pillsbury Company, The: *See—*
Desia, Nitin; Delaney, Rory A. M.; Brouwer, Peter; and Huang, Victor T., 4,434,186, Cl. 426-565.000.
Pioneer Electronic Corporation: *See—*
Yoshida, Kobun, 4,434,443, Cl. 360-74.400.
Pitney Bowes Inc.: *See—*
Couper, Robert A.; and Lillie, Terrance L., 4,434,419, Cl. 340-717.000.
Kulpa, Walter J.; and Paulik, John R., 4,433,836, Cl. 271-3.100.
Plaisant, Jacques: *See—*
Darrichard, Louis D.; and Plaisant, Jacques, 4,433,535, Cl. 57-229.000.
Plica, Peter; Schmoller, Karl; and Dresp, Gerd, to Dyckerhoff & Widmann Aktiengesellschaft. Structural components for constructing a wall. 4,433,944, Cl. 405-284.000.
Plough, Inc.: *See—*
Kingsford, Ted I., 4,433,928, Cl. 401-122.000.
McShane, James E., 4,434,154, Cl. 424-60.000.
Pochert, Kurt A.: *See—*
Shih, Kelvin; Pochert, Kurt A.; and Dunford, James M., 4,433,576, Cl. 73-204.000.
Pocock, Robert E.: *See—*
Bohl, Thomas L.; Pocock, Robert E.; and Zimmerlin, Sharon L., 4,433,922, Cl. 374-36.000.
Poisson, William H., to Albany International Corp. High temperature resistant fabrics. 4,433,493, Cl. 34-116.000.
Pollock, John J., to Frick Company. Heat transfer surface with increased liquid to air evaporative heat exchange. 4,434,112, Cl. 261-153.000.
Polymer Processing Research Institute, Ltd.: *See—*
Okada, Tokio; Kojima, Shigezo; Tani, Haruhisa; Kurihara, Kazuhiko; and Yazawa, Hirosi, 4,434,128, Cl. 264-560.000.
Pontes, Virgil M.; and Young, Lawrence C., to Double E Company Inc. Core-engager retainer for an expansible shaft. 4,433,814, Cl. 242-72.100.
Porter, Lawrence W., to Vaughan & Bushnell Manufacturing Co. Drywall hatchet. 4,433,709, Cl. 145-2.00R.
Poschel, Bruno P. H.; and Butler, Donald E., to Warner-Lambert Company. Pharmaceutical compositions and methods. 4,434,169, Cl. 424-263.000.
Posta, Antonio D. Power planing tool. 4,433,710, Cl. 145-4.000.
Potzsch, Erich: *See—*
Pietzsch, Herbert; Lachner, Walter; Hofmann, Karlheinz; Potzsch, Erich; and Esser, Fred, 4,434,494, Cl. 373-18.000.
Powell, Justin C., to Texaco Inc. 1,3-Dibromo dialkylhydantoin and olefin oligomer reaction product as a catalyst for preparing alkenyl dicarboxylic acid anhydride. 4,434,071, Cl. 252-182.000.
PPG Industries, Inc.: *See—*
Beckim, Kenneth A., 4,433,623, Cl. 101-123.000.
Frank, Robert G., 4,433,993, Cl. 65-104.000.
Girgis, Mikhail M., 4,434,208, Cl. 428-378.000.
Rukavina, Thomas G.; and Coleman, Charles R., 4,434,284, Cl. 528-58.000.
Pratt & Whitney Aircraft of Canada Limited: *See—*
Bonneau, Hilaire, 4,433,751, Cl. 181-213.000.
Preller, Hans, to Theodor Wuppermann GmbH. Method of and apparatus for the manufacturing of metal profile members, especially steel profile members. 4,433,565, Cl. 72-177.000.
Preston, Dan C., Jr.; and Kim, Yung J., to Baker Oil Tools, Inc. Energized packer anchor seal assembly. 4,433,726, Cl. 166-118.000.
Probst, Joachim; Kolb, Gunter; Mummenhoff, Peter; and Baumgen, Heinz, to Bayer Aktiengesellschaft. Cationic sizing agent for paper and a process for the preparation thereof. 4,434,269, Cl. 524-538.000.
Proctor & Gamble Company, The: *See—*
Wilkinson, Randolph N., III; Sneed, Elmore C.; and Mueller, Janet M., 4,434,136, Cl. 422-263.000.
Proficient Systems, Inc.: *See—*
Moore, Joseph L., 4,434,011, Cl. 134-6.000.
Proios, Steve: *See—*
DeGraw, Kenneth J.; Wilcockson, Brian; Nickerson, Earl W.; Bocchini, William R.; Bogossian, Armen; and Proios, Steve, 4,433,443, Cl. 4-317.000.
Prokop, Josef F.; Coons, Robert R.; and Mylander, Richard H., to International Harvester Co. Opposed reaction transmission brake. 4,433,762, Cl. 192-4.00A.

Pruett, Roy L.: *See*—
Doyle, Gerald; Pruett, Roy L.; and Savage, David W., 4,434,317, Cl. 585-845.000.
Puech, Claude; Papuchon, Michel; and Arditty, Herve, to Thomson-CSF. Integrated optical structure with velocity matched directional coupling. 4,433,895, Cl. 350-96.130.
Pugach, Joseph, to Halcon SD Group, Inc., The. Recovery of noble metal values from carbonylation residues. 4,434,240, Cl. 502-24.000.
Puglisi, Albert J.: *See*—
Maiefski, Romaine R.; and Puglisi, Albert J., 4,433,795, Cl. 222-14.000.
Puhl, Larry C., to Motorola, Inc. Microprocessor with duplicate registers for processing interrupts. 4,434,461, Cl. 364-200.000.
Purex Corporation: *See*—
Fairchild, Meredith H., 4,434,069, Cl. 252-174.140.
Putnam, Bruce M.: *See*—
Eppig, Christopher P.; Putnam, Bruce M.; and de Filippi, Richard P., 4,434,028, Cl. 196-14.520.
Queensland Rubber Company Pty. Ltd.: *See*—
Russell, Graeme E.; and Smith, Brian S., 4,433,942, Cl. 405-215.000.
Quinn, Thomas G., III, to Honeywell Inc. Thermal reference apparatus. 4,433,924, Cl. 374-2.000.
Quinquis, Jean-Paul; and Devault, Michel A. Multiprocessor topology with plural bases for directly and indirectly coupling addresses and relay stations. 4,434,463, Cl. 364-200.000.
Rabi, Tavassa; and Szekely, Eugen, to Ben Gurion University of the Negev Research and Development Authority. Method and apparatus for detecting nitrite ions in fluids. 4,434,235, Cl. 436-110.000.
Racal Data Communications Inc.: *See*—
Ferrell, Philip J., 4,434,322, Cl. 178-22.130.
Rack, Robert W.: *See*—
Mendel, Jack M.; Bomgardner, Carl C.; Rack, Robert W.; Scott, Donald G.; and Stritmater, August W., 4,433,917, Cl. 366-132.000.
Radiation Dynamics, Inc.: *See*—
Cleland, Marshall, 4,434,372, Cl. 250-400.000.
Ragot, Claude. Toilet with mechanical drainage comprising a draining chamber accessible and dismountable from inside the toilet bowl. 4,433,444, Cl. 4-319.000.
Ragsdale, Mark E.: *See*—
Malone, Thomas J.; and Ragsdale, Mark E., 4,434,067, Cl. 252-88.000.
Rainey, Amon E. Chimney cleaner. 4,433,449, Cl. 15-243.000.
Rajski, Pat A.: *See*—
Gebert, Kenneth W.; and Rajski, Pat A., 4,434,194, Cl. 427-356.000.
Ramsey, Harold E.; and Fischer, Edward E., to Du Pont de Nemours, E. I., and Company. Heat sealing film cut-off device. 4,433,527, Cl. 53-548.000.
Rasberger, Michael, to Ciba-Geigy Corporation. Phosphonous acid monoester-monoamides. 4,434,109, Cl. 260-958.000.
Rascati, Richard J.; and Berglund, Larry G., to Markel, Morris L. Operative temperature sensing system. 4,433,923, Cl. 374-112.000.
Ratchford, Lloyd G.; Werth, Dee A.; Luca, Vincent A., Jr.; and Schildkraut, Alan L., to Bendix Corporation, The. Electrical connector having a moisture seal. 4,433,889, Cl. 339-94.00M.
Ratschat, Gunter, to Mannesmann Demag AG. Method for recovery and recycling of heat from hot gases in metallurgical processing. 4,434,004, Cl. 75-41.000.
Raulins, George M.; and Grimmer, George G., to Otis Engineering Corporation. Pipe joint. 4,433,862, Cl. 285-350.000.
Rayovac Corporation: *See*—
Joshi, Ashok V.; Jatkar, Arun D.; and Sholette, William P., 4,434,216, Cl. 429-191.000.
Niles, Aaron F.; and Johnson, Dennis P., 4,434,213, Cl. 429-3.000.
Raytheon Company: *See*—
Bowen, Robert F.; and Martel, Thomas J., 4,434,343, Cl. 219-10.55F.
Dunnrowicz, Clarence J.; and Callerame, Joseph, 4,434,384, Cl. 310-325.000.
Green, Jerome J., 4,434,409, Cl. 333-24.100.
MacMaster, George H.; and Nichols, Lawrence J., 4,434,387, Cl. 315-39.300.
Metal, Israel, 4,434,369, Cl. 250-363.00S.
RCA Corporation: *See*—
Goodman, Alvin M., 4,433,469, Cl. 29-571.000.
Schiff, Leonard N., 4,434,440, Cl. 358-186.000.
Steckler, Steven A.; and Balaban, Alvin R., 4,434,439, Cl. 358-174.000.
Stewart, Roger G., 4,434,381, Cl. 307-530.000.
Strolle, Christopher H.; and Smith, Terrence R., 4,434,437, Cl. 358-140.000.
Toda, Minoru; and Shima, Eiji, 4,434,481, Cl. 369-132.000.
Yarnitsky, Yashaya; and Kaidor, Shmuel, 4,433,794, Cl. 221-224.000.
Redmon, Billy L.; and Forester, Buford G., to Custom Oilfield Products, Inc. High pressure shut-off valve. 4,433,827, Cl. 251-191.000.
Reed, Jerry O., to Phillips Petroleum Company. Polymer stabilization. 4,434,122, Cl. 264-211.000.
Reeves, William H.: *See*—
Buirley, William L.; Koopman, Donald E.; McQuain, David B.; and Reeves, William H., 4,433,637, Cl. 116-207.000.
Regan, Albert M., to Hughes Tool Company. Marine conductor bending tool and method. 4,433,939, Cl. 405-195.000.
Reid, Gary L., to Hobart Brothers Company. Cathodic cleaning of aluminum tube. 4,434,348, Cl. 219-61.000.
Reid, Kenneth E.: *See*—
Charon, Clarence W.; and Reid, Kenneth E., 4,434,255, Cl. 523-209.000.
Reiff, Harro: *See*—
Frick, Georg; Reiff, Harro; and Kirsch, Alois, 4,433,467, Cl. 29-565.000.
Reiff, Nico: *See*—
Liesch, Jean; Reiff, Nico; Reimen, Vlasta; Schmit, Romain; Schummer, Arthur; Simon, Jo; and Tonteling, Paul, 4,434,368, Cl. 250-339.000.
Reimen, Vlasta: *See*—
Liesch, Jean; Reiff, Nico; Reimen, Vlasta; Schmit, Romain; Schummer, Arthur; Simon, Jo; and Tonteling, Paul, 4,434,368, Cl. 250-339.000.
Rempfler, Hermann; and Fory, Werner, to Ciba-Geigy Corporation. Pyridyloxy-phenoxyalkanecarboxylic acid derivatives and their herbicidal use. 4,433,998, Cl. 71-94.000.
Research Corporation: *See*—
Ritts, Roy E., Jr., 4,434,230, Cl. 435-240.000.
Rexnord Inc.: *See*—
Cosenza, Frank J., 4,433,930, Cl. 403-12.000.
Rhoades, Thomas S.: *See*—
Scott, David R.; and Rhoades, Thomas S., 4,433,581, Cl. 73-786.000.
Rhodes, Delmer R.: *See*—
McGary, Charles W., Jr.; Pascarella, Vincent J.; Taller, Robert A.; Rhodes, Delmer R.; Anglin, Paul E.; and Daugherty, Charles W., 4,434,126, Cl. 264-303.000.
Rhone-Poulenc Industries: *See*—
Jung, Gerard, 4,434,231, Cl. 435-253.000.
Rhudy, John S.: *See*—
Argabright, Perry A.; and Rhudy, John S., 4,433,727, Cl. 166-252.000.
Rice, Steven G. Wall structure opening of masonry and pre-cast facade. 4,433,518, Cl. 52-211.000.
Richard, Pierre, to Bouygues. Method and a device for extending the deck of a bridge or similar structures, with desk segments, using a cable stayed beam. 4,433,525, Cl. 52-741.000.
Richter Gedeon Vegyeszeti Gyar Rt.: *See*—
Lempert, Karoly; Harsanyi, Kalman; Doleschall, Gabor; Hornyak, Gyula; Nyitrai, Jozsef; Zauer, Karoly; Fetter, Jozsef; Simig, Gyula; Gombos nee Visky, Zsuzsanna; and Szalai nee Barta, Gizella, 4,434,099, Cl. 260-239.00A.
Ricoh Company, Ltd.: *See*—
Horike, Masanori; and Ebi, Yutaka, 4,434,428, Cl. 346-75.000.
Riggs, Darius O.; and Sorbie, Thomas B., to Owens-Illinois, Inc. Leaner gauge for narrow neck containers. 4,433,785, Cl. 209-531.000.
Rinkewich, Isaac: *See*—
Khurgin, Boris; Rosinek, Shlomo; and Rinkewich, Isaac, 4,433,577, Cl. 73-290.00V.
Ripper, Wolfgang, to Robert Bosch GmbH. Apparatus for regulating the exhaust gas recirculation rate in internal combustion engines having self-ignition. 4,433,667, Cl. 123-569.000.
Risdal, Norton W., to Gustafson, Inc. Sampler for flowing pressurized dry material. 4,433,587, Cl. 73-863.540.
Ritts, Roy E., Jr., to Research Corporation. Human nonsecretory plasmacytoid cell line. 4,434,230, Cl. 435-240.000.
RIV-SKF Officine Di Villar Perosa SpA: *See*—
Colanzi, Franco, 4,433,877, Cl. 308-191.000.
Rivalle, Christian: *See*—
Bisagni, Emile; Ducrocq, Claire; Rivalle, Christian; Tambourin, Pierre; Wendling, Francoise; Civier, Alain; Montagnier, Luc; Chermann, Jean-Claude; Gruest, Jacqueline; and Lidereau, Rosette, 4,434,290, Cl. 546-70.000.
Robert Bosch GmbH: *See*—
Fritz, Adolf R., 4,433,670, Cl. 123-644.000.
Ripper, Wolfgang, 4,433,667, Cl. 123-569.000.
Robertson, John M.; Breed, Dirk J.; and Voermans, Antonius B., to U.S. Philips Corporation. Device for propagating magnetic domains. 4,434,212, Cl. 428-693.000.
Robillard, Jean J. Controlling crystallinity and thickness of monocrystalline layer by use of an elliptically polarized beam of light. 4,434,025, Cl. 156-601.000.
Robinson, Keith D.; and Smitley, George P., to Goodyear Aerospace Corporation. Reverse building process for the manufacture of complex-shaped vehicle fuel tanks. 4,434,021, Cl. 156-242.000.
Robinson, Tibor; and Voegtlin, Charles, to Sandoz Ltd. Method of accelerating the drying of wet hydropohilic substrates. 4,434,196, Cl. 427-389.000.
Rockford Ball Screw Co.: *See*—
Benoit, Harold P.; LaPasso, Leonard J.; and McBain, Ian, 4,433,590, Cl. 74-409.000.
Rockwell International Corporation: *See*—
Best, David W.; and Russell, Jeffrey D., 4,434,474, Cl. 364-900.000.
Cleveland, Donald C., 4,433,934, Cl. 403-318.000.
Fowks, William R., 4,434,406, Cl. 331-3.000.
Huffman, Charles E.; and Southerland, Stephen R., 4,434,485, Cl. 370-55.000.
Rodder, Fritz: *See*—
Lemke, Norbert, 4,434,500, Cl. 378-99.000.
Rodrigues, John J. Fuel system for an internal combustion engine. 4,433,664, Cl. 123-527.000.
Rohm and Haas Company: *See*—
Fellman, Robert P.; Hurwitz, Marvin J.; Myers, Robert M.; and Slack, Gerald F., 4,433,958, Cl. 433-199.000.

Rojey, Alexandre; and Cheron, Jacques, to Institut Francais du Petrole. Process for producing cold and/or heat by use of an absorption cycle with carbon dioxide as working fluid. 4,433,554, Cl. 62-112.000.

Roland, Manfred W., to All-Lock Electronics, Inc. Key reading system. 4,433,487, Cl. 33-174.00F.

Rolfe, Robert M., to Bell Telephone Laboratories, Incorporated. Response time bidirectional circuitry. 4,434,497, Cl. 375-7.000.

Roling, Paul V.; Veazey, Richard L.; and Aylward, David E., to Cities Service Co. Polymerization catalyst. 4,434,242, Cl. 502-107.000.

Rollings, Robert W.: *See*—
Cassarly, James W.; Rollings, Robert W.; and Youngfleish, Frank C., 4,433,886, Cl. 339-14.00R.

Rollins, Kay; Key, Anthony N.; and Arlotte, Thomas F., to British Hovercraft Corporation Ltd. Air cushion vehicle. 4,433,745, Cl. 180-118.000.

Romagnoli, Andrea, to Industria Macchine Automatiche. Volumetric dosing apparatus for particulate matter. 4,433,798, Cl. 222-255.000.

Romain, John: *See*—
McCoy, Kenneth H.; and Romain, John, 4,433,683, Cl. 128-57.000.

Romanowski, Robert F., to Latone, Salvatore. Sheet sorter apparatus. 4,433,837, Cl. 271-293.000.

Romero, Richard A.; and Schmidt, Michael J., to Chicago Rawhide Manufacturing Company. Readily removable shaft seal including venting tab. 4,433,846, Cl. 277-9.000.

Roneo Alcatel Limited: *See*—
Clark, Leslie, 4,434,198, Cl. 428-43.000.

Rood, Robert M. Coil spring switch. 4,434,338, Cl. 200-276.000.

Rosa, Hugh E.; and Slaterpryce, Allen A., to General Electric Company. Precision rotor indexing device. 4,433,595, Cl. 74-813.00L.

Rosenski, Josephine M.: *See*—
Gold, Samuel; Tracton, Arthur A.; and Rosenski, Josephine M., 4,434,259, Cl. 524-31.000.

Rosenthal, Ben J., to Rosenthal Manufacturing Co., Inc. Self-aligning bearing assembly. 4,433,878, Cl. 308-203.000.

Rosenthal Manufacturing Co., Inc.: *See*—
Rosenthal, Ben J., 4,433,878, Cl. 308-203.000.

Rosinek, Shlomo: *See*—
Khurgin, Boris; Rosinek, Shlomo; and Rinkewich, Isaac, 4,433,577, Cl. 73-290.00V.

Rosinski, Joseph: *See*—
Schenone, Carl E.; and Rosinski, Joseph, 4,433,978, Cl. 48-76.000.

Rosser, Robert W.; Chen, Timothy S.; and Cheng, Chung-Heng, to United States of America, National Aeronautics and Space Administration. Process for preparing perfluorotriazine elastomers and precursors thereof. 4,434,106, Cl. 260-465.50R.

Rott, Hans: *See*—
Dumm, Heinz; Koerner, Gotz; Krakenberg, Manfred; Rott, Hans; and Schmidt, Gunter, 4,434,008, Cl. 106-271.000.

Roush, Roy W., Jr., to General Motors Corporation. Railway truck bearing mounting assembly. 4,433,629, Cl. 105-222.000.

Rousseau, Kenneth E., to Harper Trucks, Inc. Wire guide and retainer assembly. 4,433,816, Cl. 242-129.620.

Roussel, Francoise: *See*—
Motsch, Roger; Roussel, Francoise; and Lolivier, Germain, 4,434,499, Cl. 375-122.000.

Roussel Uclaf: *See*—
Barton, Derek H. R.; and Motherwell, William B., 4,434,080, Cl. 502-152.000.
Martel, Jacques; Tessier, Jean; and Teche, Andre, 4,434,294, Cl. 549-65.000.

Rowland, David A. Combined bottle cap opener. 4,433,597, Cl. 81-3.10R.

Rubino, Andrew M.: *See*—
Jones, John L.; and Rubino, Andrew M., 4,434,155, Cl. 424-47.000.

Rubinson, Barry L.; Parenti, Mark A.; Lary, Richard F.; and Gardner, Edward A., to Digital Equipment Corporation. Disk format for secondary storage system. 4,434,487, Cl. 371-10.000.

Rude, Edward T.; Nisenson, Jules; and Waine, Martin, to General Clutch Corp. Spring clutches. 4,433,765, Cl. 192-41.00S.

Rudolph, Hans: *See*—
Buysch, Hans-Josef; Krimm, Heinrich; and Rudolph, Hans, 4,434,105, Cl. 260-463.000.

Ruggeri, Robert T.: *See*—
Ballestrasse, Cindy L.; and Ruggeri, Robert T., 4,434,249, Cl. 521-27.000.

Rukavina, Thomas G.; and Coleman, Charles R., to PPG Industries, Inc. Polyurethane formulation for large scale casting. 4,434,284, Cl. 528-58.000.

Ruopp, Gerhard: *See*—
Koeck, Klaus; Bambach, Wolfgang; Ruopp, Gerhard; and Mikley, Frank, 4,434,326, Cl. 179-2.0DP.

Russell, Graeme E.; and Smith, Brian S., to Queensland Rubber Company Pty. Ltd. Wharf fender. 4,433,942, Cl. 405-215.000.

Russell, Jeffrey D.: *See*—
Best, David W.; and Russell, Jeffrey D., 4,434,474, Cl. 364-900.000.

Ruszala, Ferdinand A., to Ashland Oil, Inc. Oxydehydrogenation of isobutyric acid and its lower alkyl esters. 4,434,298, Cl. 562-599.000.

Rutherford, Ralph E. Flow splitting device for fluid flow meter. 4,433,575, Cl. 73-202.000.

Ruumpol, Geurt J., to Inductive Control Systems B.V. Contactless, electric control-handle. 4,434,412, Cl. 336-134.000.

Ruzek, Ivo: *See*—
Hartman, Ludwig; Ruzek, Ivo; and Locher, Engelbert, 4,434,204, Cl. 428-198.000.

Ryckman, William D., Jr., to General Electric Company. Strain gage scale. 4,433,741, Cl. 177-199.000.

Rys-Sikora, John, to Du Pont de Nemours, E. I., and Company; and Bata Shoe Company. Low density closed-cell foamed articles from ethylene copolymer/vinyl or vinylidene halide blends. 4,434,253, Cl. 521-134.000.

Rzeszewski, Theodore S., to Matsushita Electric Industrial Co., Ltd. Low cost automatic equalizer. 4,434,438, Cl. 358-167.000.

S&C Electric Company: *See*—
Jarosz, John M.; and Panas, William R., 4,434,415, Cl. 337-186.000.

Sado, Ryoichi; and Tahara, Kazutoki, to Shin-Etsu Polymer Co., Ltd. Adjustable and readily solderable sheet-like connectors. 4,433,887, Cl. 339-17.00R.

Sainte-Foi, Daniel: *See*—
Debouzie, Alain; Sainte-Foi, Daniel; and Blandin, Yannick, 4,433,992, Cl. 65-3.100.

Saito, Junichi; and Kume, Toyohiko, to Nihon Tokushu Noyaku Seizo K.K. Preparation and use of bis-(1-bromo-2,3,3-trichloro-2-propenyl) ether. 4,434,303, Cl. 568-686.000.

Sakamoto, Takeshi: *See*—
Andoh, Tetsuji; Takagi, Shigeji; and Sakamoto, Takeshi, 4,433,472, Cl. 29-596.000.

Sakuma, Isamu; Nishida, Katsuhiko; Kawano, Hideo; Ueno, Masayasu; Matsumoto, Yoshishige; Matsumoto, Shohei; and Furuse, Takao, to Nippon Electric Co., Ltd. Semiconductor laser. 4,434,491, Cl. 372-48.000.

Sakuma, Shinzo; Yanagisawa, Hifumi; Tokuhata, Kazuo; and Miyagawa, Hiroshi, to Kabushiki Kaisha Meidensha; and Kabushiki Kaisha GEMV AC. Vacuum power interrupting device. 4,434,331, Cl. 200-144.00B.

Saleh, Yousef; Breedis, John F.; and Crane, Jacob, to Olin Corporation. Precipitation hardenable copper alloy and process. 4,434,016, Cl. 148-12.70C.

Salisbury, Winfield W., to Energy Profiles, Inc. Electron space charge channeling for focusing ion beams. 4,434,130, Cl. 376-107.000.

Salk Institute for Biological Studies, The: *See*—
Trowbridge, Ian S., 4,434,156, Cl. 424-85.000.

Salmon, Joe E.; Strother, Fleetwood E.; and Crawford, James R., to Allied Products Corporation. Saw type gin stand with seed removal tube. 4,433,454, Cl. 19-55.00R.

Salsbery, Charles L.: *See*—
Kleykamp, Gayheart C.; Goldwater, Sam; and Salsbery, Charles L., 4,434,436, Cl. 358-118.000.

Salton, Robert B.: *See*—
Spiegelman, Stanley R.; Salton, Robert B.; Beer, Robert W.; Malandra, Louis J.; and Cognevich, Michael L., 4,433,828, Cl. 254-29.00A.

Samanta, Shyam K.: *See*—
Ezis, Andre; Samanta, Shyam K.; and Subramanian, Krishnamoorthy, 4,434,238, Cl. 501-98.000.

Sammarco, Peter: *See*—
Kesl, Elmer M.; Scarnato, Thomas J.; and Sammarco, Peter, 4,433,531, Cl. 56-106.000.

Sammons, David W.: *See*—
Adams, Lonnie D.; and Sammons, David W., 4,434,234, Cl. 436-86.000.

Samsonite Corporation: *See*—
Winter, Roger D.; Workman, David E.; and Nordstrom, Mark B., 4,433,761, Cl. 190-109.000.

Sanchez, Robert A., to American Hoechst Corporation. Tetrahydrothiophene derivatives and methods of preparation. 4,434,293, Cl. 549-17.000.

Sanden Corporation: *See*—
Fukushima, Eiji; Fukuhara, Seiichi; and Hiraga, Masaharu, 4,433,564, Cl. 72-146.000.

Sander, Ingolf; and Hill, Bernhard, to U.S. Philips Corporation. Mechanically addressed optical memory. 4,434,477, Cl. 365-120.000.

Sanders, David: *See*—
Bresin, Elias H., 4,433,718, Cl. 165-12.000.

Sanders, James M.: *See*—
Hall, John B.; Sanders, James M.; and Siano, James N., 4,433,695, Cl. 131-276.000.

Sandoz, Inc.: *See*—
Barcza, Sandor, 4,434,161, Cl. 424-184.000.

Sandoz Ltd.: *See*—
Muller, Werner, 4,434,171, Cl. 424-267.000.
Robinson, Tibor; and Voegtlin, Charles, 4,434,196, Cl. 427-389.000.
Troxler, Franz; and Seemann, Fritz, 4,434,176, Cl. 424-274.000.

Sankyo Company, Limited: *See*—
Kobayashi, Shinsaku; and Ogiso, Akira, 4,434,179, Cl. 424-308.000.

Santa Lucia, Ralph. Hair dryer insert to maintain hair position. 4,433,492, Cl. 34-99.000.

Santinelli, Joseph, to Mars Alcatel. Crimping tongs. 4,433,569, Cl. 72-410.000.

Sarin, Vinod K., to GTE Laboratories, Inc. Mining drill. 4,433,739, Cl. 175-410.000.

Sarin, Vinod K.; Penty, Robert A.; and Buljan, Sergej-Tomislav, to GTE Laboratories Incorporated. Abrasion resistant silicon nitride based articles. 4,433,979, Cl. 51-307.000.

Sarnoff, Stanley J.; Malooley, Rudolph S.; Calkins, George B.; and Tarello, William R., to Survival Technology, Inc. Assembly for administering respiratory medicament dosage through a gas mask. 4,433,684, Cl. 128-203.210.

Sasajima, Junnosuke; Nagai, Hiroshi; Mogi, Kenji; Nojiri, Akio; and Shiina, Naonori, to Furukawa Electric Co., Ltd., The. Cross-linked polyvinyl chloride resin foam and method of manufacturing the same. 4,434,251, Cl. 521-75.000.

Sasaki, Kan: *See*—
Ikemoto, Kazuhito; Katayama, Nobuaki; Terakura, Yukio; and Sasaki, Kan, 4,433,593, Cl. 74-606.00R.

Sasaki, Tohru; Ohta, Mitsuru; Terasaki, Syuuzi; and Kakizaki, Syozo, to Kureha Kagaku Kogyo Kabushiki Kaisha. Capacitor. 4,434,209, Cl. 428-416.000.

Sasaki, Yoshitaka: *See*—
Kameyama, Shuichi; Kanzaki, Koichi; and Sasaki, Yoshitaka, 4,433,470, Cl. 29-577.00C.

Sasayama, Takao: *See*—
Amano, Matsuo; Teranishi, Takao; Mouri, Yasunori; Abe, Osamu; and Sasayama, Takao, 4,433,650, Cl. 123-179.00G.

Sato, Masaaki, to Olympus Optical Company Ltd. Tape cassette loading device for cassette tape recorder. 4,434,444, Cl. 360-96.500.

Sato, Mikio: *See*—
Imahori, Seiichi; Kaneko, Masaharu; Ozawa, Tetsuo; Imazeki, Shuji; Mukoh, Akio; and Sato, Mikio, 4,434,072, Cl. 252-299.100.

Sato, Yoichiro: *See*—
Kamo, Mutsukazu; Matsumoto, Seiichiro; Sato, Yoichiro; and Setaka, Nobuo, 4,434,188, Cl. 427-39.000.

Satoh, Tetsuo; Ohgami, Masaaki; and Ogata, Shoji, to Fuji Jukogyo Kabushiki Kaisha. Instructing system for a four-wheel drive vehicle. 4,433,748, Cl. 180-247.000.

Satoh, Tetsuo: *See*—
Izutsu, Tadashi; Koutake, Masanobu; Hiraoka, Yasunobu; Takafuji, Shin-ichi; Yamada, Tamotsu; Kurosawa, Seiji; and Satoh, Tetsuo, 4,433,618, Cl. 99-455.000.

Satoh, Yoshio: *See*—
Matsuda, Kazuo; Ohashi, Makoto; Satoh, Yoshio; Miyashita, Tsutomu; and Komenou, Kazunari, 4,434,476, Cl. 365-12.000.

Sattlegger, Hans; Schnurrbusch, Karl; Degen, Bruno; and Achtenberg, Theo, to Bayer Aktiengesellschaft. Polysiloxane molding compositions. 4,434,283, Cl. 528-34.000.

Savage, David W.: *See*—
Doyle, Gerald; Pruett, Roy L.; and Savage, David W., 4,434,317, Cl. 585-845.000.

Sawada, Shizuo; Ogura, Mitsugi; and Endo, Norio, to Tokyo Shibaura Denki Kabushiki Kaisha. Method of evaluating measure precision of patterns and photomask therefor. 4,433,911, Cl. 355-125.000.

Scalzo, Joseph. Wabbler plate engine mechanisms. 4,433,596, Cl. 74-839.000.

Scarnato, Thomas J.: *See*—
Kesl, Elmer M.; Scarnato, Thomas J.; and Sammarco, Peter, 4,433,531, Cl. 56-106.000.

Schaefer, Daniel W., to Simplicity Manufacturing, Inc. Interlock mechanism preventing engine starting when a mower is in power drive. 4,433,530, Cl. 56-11.800.

Schaefer, Daniel W.: *See*—
Hochwitz, Lynn E.; Schaefer, Daniel W.; and Dawson, Michael L., 4,433,868, Cl. 296-190.000.

Schaefer, Edward F.: *See*—
Clarke, Frederick; Lorenzi, Donald E.; and Schaefer, Edward F., 4,434,427, Cl. 346-33.00P.

Schaevitz Engineering: *See*—
Snow, Ralph K., Jr., 4,433,571, Cl. 73-37.500.

Schaffhausen, John G.: *See*—
Serres, Carl; and Schaffhausen, John G., 4,434,270, Cl. 524-570.000.

Schaper, Siegfried, to Audi Nsu Auto Union Aktiengesellschaft. Method for production of a helical spring from a fiber-reinforced plastic. 4,434,121, Cl. 264-174.000.

Schedler, Heinz: *See*—
Spielvogel, Harry; and Schedler, Heinz, 4,433,612, Cl. 91-514.000.

Schell, Francis J.: *See*—
Goes In Center, Kate; and Schell, Francis J., 4,433,909, Cl. 355-75.000.

Schenone, Carl E.; and Rosinski, Joseph, to Westinghouse Electric Corp. Fluidized bed gasification ash reduction and removal system. 4,433,978, Cl. 48-76.000.

Schiff, Leonard N., to RCA Corporation. FM/TV Transmission system. 4,434,440, Cl. 358-186.000.

Schildkraut, Alan L.: *See*—
Ratchford, Lloyd G.; Werth, Dee A.; Luca, Vincent A., Jr.; and Schildkraut, Alan L., 4,433,889, Cl. 339-94.00M.

Schimmel, Vernon R., to Symons Corporation. Adjustable long bolt. 4,433,826, Cl. 249-38.000.

Schindler, Harvey D., to Lummus Company, The. Hydrotreating catalyst and use thereof. 4,434,048, Cl. 208-112.000.

Schleif, George H. Fish hook apparatus with covering body portion. 4,433,503, Cl. 43-42.100.

Schleimer, Francois: *See*—
Metz, Paul; Schleimer, Francois; Goedert, Ferdinand; Henrion, Romain; Klein, Henri; and Liesch, Jean-Francois, 4,434,005, Cl. 75-60.000.

Schlumberger Technical Corporation: *See*—
Hulin, Jean-Pierre, 4,433,573, Cl. 73-155.000.

Schmid, Alfred, Jr.; Muller, Hans; and Jaecklin, Alexander P., to Coltene AG. Dentist's apparatus for storing and vibration mixing of amalgam components. 4,433,779, Cl. 206-220.000.

Schmidt, Gunter: *See*—
Dumm, Heinz; Koerner, Gotz; Krakenberg, Manfred; Rott, Hans; and Schmidt, Gunter, 4,434,008, Cl. 106-271.000.

Schmidt, Karl: *See*—
Muller, Hans-Jurgen; Schmidt, Karl; Chattopadhayay, Asoke; Heidemanns, Rolf P.; Habel, Georg; and Wittman, Ortwin, 4,433,662, Cl. 123-438.000.

Schmidt, Michael J.: *See*—
Romero, Richard A.; and Schmidt, Michael J., 4,433,846, Cl. 277-9.000.

Schmit, Romain: *See*—
Liesch, Jean; Reiff, Nico; Reimen, Vlasta; Schmit, Romain; Schummer, Arthur; Simon, Jo; and Tonteling, Paul, 4,434,368, Cl. 250-339.000.

Schmoller, Karl: *See*—
Plica, Peter; Schmoller, Karl; and Dresp, Gerd, 4,433,944, Cl. 405-284.000.

Schnabel, Roland: *See*—
Cook, Lee M.; Mader, Karl-Heinz; and Schnabel, Roland, 4,434,191, Cl. 427-165.000.

Schneider, Paul: *See*—
Beriger, Conrad; Kucera, Ladislav; Schneider, Paul; and Spittaler, Gunther, 4,434,417, Cl. 338-53.000.

Schnurrbusch, Karl: *See*—
Sattlegger, Hans; Schnurrbusch, Karl; Degen, Bruno; and Achtenberg, Theo, 4,434,283, Cl. 528-34.000.

Schoener, Harry E. Reinforced gutter hanger supporting bar. 4,433,512, Cl. 52-11.000.

Scholten, Joseph J. F.: *See*—
De Munck, Nicolaas A.; and Scholten, Joseph J. F., 4,434,302, Cl. 568-454.000.

Schonberger, Milton. Thermistors, and a method of their fabrication. 4,434,416, Cl. 338-22.00R.

Schott Glass Technologies, Inc.: *See*—
Cook, Lee M.; Mader, Karl-Heinz; and Schnabel, Roland, 4,434,191, Cl. 427-165.000.

Schrepel, William J., to PBS Associates. Transistorized radio receiver combination with male power input and female power output connections. 4,434,509, Cl. 455-343.000.

Schreyer, Gerd: *See*—
Bach, Gerhard; Geiger, Friedhelm; Heimberger, Werner; Schreyer, Gerd; and Hillenbrand, Horst, 4,434,148, Cl. 423-379.000.

Schroeder, Warren C. Water closet-odor neutralizer. 4,433,441, Cl. 4-213.000.

Schubring, Norman W., to General Motors Corporation. Microwave heating control and calorimetric analysis. 4,434,342, Cl. 219-10.55M.

Schulte-Schlagbaum AG: *See*—
Eisermann, Armin; Eicken, Heinz T.; and Geiger, Diethard, 4,433,772, Cl. 194-59.000.

Schulte, Steve W.: *See*—
Henges, J. Gordon, Jr.; and Schulte, Steve W., 4,433,514, Cl. 52-94.000.

Schultes, Tilmann; and Seidel, Joachim, to Kortenbach & Rauh Kommanditgesellschaft. Sunshade. 4,433,699, Cl. 135-20.00R.

Schulz, Daniel R. Controller for air conditioning or heating system. 4,433,809, Cl. 236-47.000.

Schumacher, Frederick G.; and Yllo, Walter, to Du Pont de Nemours, E. I., and Company. Organic acid containing filled and plasticized thermoplastic compositions based on ethylene interpolymers. 4,434,258, Cl. 524-13.000.

Schummer, Arthur: *See*—
Liesch, Jean; Reiff, Nico; Reimen, Vlasta; Schmit, Romain; Schummer, Arthur; Simon, Jo; and Tonteling, Paul, 4,434,368, Cl. 250-339.000.

Schurfeld, Armin: *See*—
Hartel, Gunter; Schurfeld, Armin; and Jordan, Wolfgang, 4,433,661, Cl. 123-339.000.

Schutte, Heinz: *See*—
Kommoss, Klaus; and Schutte, Heinz, 4,434,442, Cl. 360-74.200.

Schwartz, Robert, to Dr. Ing. Rudolf Hell GmbH. Method and a circuit for determining a contour in an image. 4,433,912, Cl. 356-150.000.

Schwarzmann, Matthias: *See*—
Hoelderich, Wolfgang; Mross, Wolf D.; and Schwarzmann, Matthias, 4,434,314, Cl. 585-640.000.

Scott, Arden L.: *See*—
Kellogg, Walter J.; Scott, Arden L.; and Seneadza, Samuel K., 4,434,394, Cl. 318-771.000.

Scott, Dale. Hair coloring calculator. 4,434,467, Cl. 364-400.000.

Scott, David R.; and Rhoades, Thomas S. Offshore platform structural assessment system. 4,433,581, Cl. 73-786.000.

Scott, Donald G.: *See*—
Mendel, Jack M.; Bomgardner, Carl C.; Rack, Robert W.; Scott, Donald G.; and Stritmater, August W., 4,433,917, Cl. 366-132.000.

Scuccato, Serge L.; and Shaver, Marvin B., to Dominion Engineering Works Limited. Grinding mill control system. 4,433,769, Cl. 192-0.098.

Seemann, Fritz: *See*—
Troxler, Franz; and Seemann, Fritz, 4,434,176, Cl. 424-274.000.

Seidel, Joachim: *See*—
Schultes, Tilmann; and Seidel, Joachim, 4,433,699, Cl. 135-20.00R.

Seidel, William C.: *See*—
Hicks, William T.; and Seidel, William C., 4,434,084, Cl. 252-512.000.

Seidler, Jack, to North American Specialties Corp. Terminal strip with auxiliary support. 4,433,892, Cl. 339-258.00P.

Sekimura, Nobuyuki, to Canon Kabushiki Kaisha. Permanent display liquid crystal device via voltage application. 4,433,900, Cl. 350-331.00R.

Sekine, Kunio; Suzuki, Yoshiki; Yamashita, Gentaro; and Yamaguchi, Hisao, to Teijin Limited. Pharmaceutical composition for intrarectal

administration, and suppository prepared therefrom. 4,434,159, Cl. 424-178.000.
Sekisui Kagaku Kogyo Kabushiki Kaisha: *See*—
Kanamori, Kozo; Ishimoto, Akio; Konishi, Masaaki; Maita, Hitoshi; and Shimoyama, Hiroshi, 4,434,023, Cl. 156-307.300.
Sekiya, Fukuo; Morokawa, Shigeru; and Iwakura, Ryoji, to Citizen Watch Company Limited. Electronic timepiece having improved primary frequency divider response characteristics. 4,433,920, Cl. 368-201.000.
Sekiya, Fukuo: *See*—
Nishimura, Katsuo; and Sekiya, Fukuo, 4,433,918, Cl. 368-74.000.
Sekiya, Shigenobu: *See*—
Kato, Tetsuo; Abeyama, Shozo; Kimura, Atsuyoshi; Sekiya, Shigenobu; and Nakamura, Sadayuki, 4,434,006, Cl. 75-123.00R.
Selfixat, S.A.: *See*—
Dubois, Robert; and Dubois, Pierre-Yves, 4,434,190, Cl. 427-136.000.
Sellet, Frederick; George, Guerino F.; and Abbondante, Thomas S. Rear view mirror for drop type bicycle handle bars. 4,433,899, Cl. 350-307.000.
Selsted, Walter T., to Arneson Products, Inc. Pool cleaning device for rolling operation under pool cover. 4,434,050, Cl. 210-169.000.
Seneadza, Samuel K.: *See*—
Kellogg, Walter J.; Scott, Arden L.; and Seneadza, Samuel K., 4,434,394, Cl. 318-771.000.
Seppala, Earl E., to Du Pont de Nemours, E. I., and Company. Window regulator. 4,433,509, Cl. 49-352.000.
Sera Solar Corporation: *See*—
Gibbons, James F., 4,434,318, Cl. 136-258.000.
Seragnoli, Enzo, to G. D Societa per Azioni. Device for applying filters to cigarettes. 4,433,694, Cl. 131-92.000.
Sercati S.A.R.L.: *See*—
Offenstadt, Eric, 4,433,747, Cl. 180-227.000.
Serres, Carl; and Schaffhausen, John G., to Standard Oil Company (Indiana). Ethylene/propylene/vinyl alkyl ketone polymers. 4,434,270, Cl. 524-570.000.
Setaka, Nobuo: *See*—
Kamo, Mutsukazu; Matsumoto, Seiichiro; Sato, Yoichiro; and Setaka, Nobuo, 4,434,188, Cl. 427-39.000.
Setra Systems, Inc.: *See*—
Briefer, Dennis K., 4,434,203, Cl. 428-152.000.
Lee, Shih-Ying, 4,433,742, Cl. 177-229.000.
Sexton Can Company, Inc.: *See*—
Mulawski, Walter J., 4,433,791, Cl. 220-89.00A.
Seydin, Saeid; and Thomas, Thomas, to Collagen Corporation. Partially purified osteogenic factor and process for preparing same from demineralized bone. 4,434,094, Cl. 260-112.00R.
Shaffer, Thomas C.: *See*—
Grover, Mark D.; and Shaffer, Thomas C., 4,433,829, Cl. 254-131.000.
Shakespeare Company, The: *See*—
Parsons, James H., Jr.; Hardy-The McLain, Philippe; and Tringali, Dominick, 4,433,933, Cl. 403-268.000.
Sharber, Jerry L.; and McNeal, Ronald E., to Sheller Globe. Copy holder with motor driven line guide. 4,433,499, Cl. 40-356.000.
Sharp Kabushiki Kaisha: *See*—
Higuchi, Masayuki, 4,434,395, Cl. 320-1.000.
Shaver, Marvin B.: *See*—
Scuccato, Serge L.; and Shaver, Marvin B., 4,433,769, Cl. 192-0.098.
Shell Oil Company: *See*—
Slaugh, Lynn H.; and Willis, Carl L., 4,433,981, Cl. 55-59.000.
Sheller Globe: *See*—
Sharber, Jerry L.; and McNeal, Ronald E., 4,433,499, Cl. 40-356.000.
Sherman, Randy J.: *See*—
Hanson, Derald F.; and Sherman, Randy J., 4,433,894, Cl. 350-6.800.
Shiembob, Lawrence T., to United Technologies Corporation. Insulated honeycomb seal. 4,433,845, Cl. 277-1.000.
Shigematsu, Kazuo: *See*—
Terao, Motoyasu; Horigome, Shinkichi; Mitsuya, Munehisa; Ota, Sakae; and Shigematsu, Kazuo, 4,434,429, Cl. 346-135.100.
Shih, Kelvin; Pochert, Kurt A.; and Dunford, James M., to General Motors Corporation. Mass airflow sensor. 4,433,576, Cl. 73-204.000.
Shihabi, David S.: *See*—
Audeh, Costandi A.; and Shihabi, David S., 4,434,046, Cl. 208-111.000.
Shiina, Naonori: *See*—
Sasajima, Junnosuke; Nagai, Hiroshi; Mogi, Kenji; Nojiri, Akio; and Shiina, Naonori, 4,434,251, Cl. 521-75.000.
Shima, Eiji; Den, Hiroshi; and Kuroki, Takeo, to FEPS International, Ltd.; and Fujikura Cable Works, Ltd., The. Electric power-feeding structure. 4,434,377, Cl. 307-147.000.
Shima, Eiji: *See*—
Toda, Minoru; and Shima, Eiji, 4,434,481, Cl. 369-132.000.
Shimada, Shinichi: *See*—
Amano, Katsuhisa; Kumagai, Tadashi; Masaki, Akio; Shimada, Shinichi; Suzuki, Takeshi; and Ohtaka, Shoichi, 4,433,561, Cl. 60-293.000.
Shimano Industrial Company Limited: *See*—
Shimano, Keizo, 4,433,963, Cl. 474-80.000.
Shimano, Keizo, to Shimano Industrial Company Limited. Chain guide for a derailleur for a bicycle. 4,433,963, Cl. 474-80.000.
Shimba, Satoru: *See*—
Sugita, Hiroshi; Tsuda, Yasuo; Ito, Kenji; and Shimba, Satoru, 4,434,225, Cl. 430-544.000.
Shimizu, Hidetoshi: *See*—
Uedaira, Satoru; Shimizu, Hidetoshi; Tamura, Hidemasa; Taguchi, Hiromichi; Yamanoi, Hiroshi; and Makino, Yoshimi, 4,434,202, Cl. 428-143.000.
Shimoyama, Hiroshi: *See*—
Kanamori, Kozo; Ishimoto, Akio; Konishi, Masaaki; Maita, Hitoshi; and Shimoyama, Hiroshi, 4,434,023, Cl. 156-307.300.
Shimura, Atsuo, to Nissan Motor Company, Limited. Heat-shielding structure. 4,433,542, Cl. 60-299.000.
Shin-Etsu Engineering Co., Ltd.: *See*—
Katagiri, Kiyoo; and Honda, Mitsuo, 4,433,510, Cl. 51-165.00R.
Shin-Etsu Polymer Co., Ltd.: *See*—
Katumi, Horiko; and Hideyuki, Noma, 4,434,123, Cl. 264-225 000.
Sado, Ryoichi; and Tahara, Kazutoki, 4,433,887, Cl. 339-17.00R.
Shin, Hi B. Engine. 4,433,649, Cl. 123-54.00R.
Shinbori, Takeyoshi: *See*—
Tabe, Takayuki; and Shinbori, Takeyoshi, 4,433,833, Cl. 267-18.000.
Shioyama, Tad K.: *See*—
Murtha, Timothy P.; and Shioyama, Tad K., 4,434,082, Cl. 502-164.000.
Shoher, Itzhak; and Whiteman, Aharon. Method for bonding ceramic to noble based metals and product. 4,434,211, Cl. 428-552.000.
Sholette, William P.: *See*—
Joshi, Ashok V.; Jatkar, Arun D.; and Sholette, William P., 4,434,216, Cl. 429-191.000.
Shuey, David R.: *See*—
Marsh, Dana G.; Shuey, David R.; and Webb, John L., 4,434,353, Cl. 219-216.000.
Shupert, Paul T.: *See*—
Herwig, Warren E.; Kaminski, Tony L.; and Shupert, Paul T., 4,433,529, Cl. 56-10.200.
Siano, James N.: *See*—
Hall, John B.; Sanders, James M.; and Siano, James N., 4,433,695, Cl. 131-276.000.
Sidman, Kenneth R.; and Arons, Irving J., to United States of America, National Aeronautics and Space Administration; and Tschirch, Richard P. Heat resistant protective hand covering. 4,433,439, Cl. 2-161.00R.
Siemens AG: *See*—
Green, Philip S.; and Taenzer, Jon C., 4,433,690, Cl. 128-660.000.
Siemens Aktiengesellschaft: *See*—
Emshoff, Horst W.; and Kusebauch, Walter, 4,434,058, Cl. 210-662.000.
Hildinger, Eugen, deceased, 4,434,471, Cl. 364-900.000.
Hoerschelmann, Konstantin; Kausche, Helmold; and Spath, Werner, 4,434,036, Cl. 204-164.000.
SIG Schweizerische Industrie-Gesellschaft: *See*—
Baumann, Jurgen, 4,433,611, Cl. 89-193.000.
Sigma Tool & Machine Limited: *See*—
Figge, Siegfried E. O.; and Leistner, Herbert E., 4,433,782, Cl. 206-338.000.
Sikorski, James A.; and Hoobler, Mary A., to Monsanto Company. Aminosulenamide derivatives of N-phosphonomethylglycinonitriles as herbicides. 4,433,996, Cl. 71-087.000.
Simig, Gyula: *See*—
Lempert, Karoly; Harsanyi, Kalman; Doleschall, Gabor; Hornyak, Gyula; Nyitrai, Jozsef; Zauer, Karoly; Fetter, Jozsef; Simig, Gyula; Gombos nee Visky, Zsuzsanna; and Szalai nee Barta, Gizella, 4,434,099, Cl. 260-239.00A.
Siminoff, Roger. Component musical instrument. 4,433,603, Cl. 84-1.160.
Simon, Jo: *See*—
Liesch, Jean; Reiff, Nico; Reimen, Vlasta; Schmit, Romain; Schummer, Arthur; Simon, Jo; and Tonteling, Paul, 4,434,368, Cl. 250-339.000.
Simons, Leslie H., to Texaco Inc. Process for preparing ethylene glycol and lower monohydric alcohols from syngas using a novel catalyst system. 4,434,246, Cl. 518-700.000.
Simonseth, John. Basketball rim assembly. 4,433,839, Cl. 273-1.50R.
Simonson, Kent L.: *See*—
Leining, Lyndon R.; and Simonson, Kent L., 4,433,453, Cl. 17-21.000.
Simplicity Manufacturing, Inc.: *See*—
Hochwitz, Lynn E.; Schaefer, Daniel W.; and Dawson, Michael L., 4,433,868, Cl. 296-190.000.
Schaefer, Daniel W., 4,433,530, Cl. 56-11.800.
Simpson, David P.; and Stirling, Robert, to Electricity Council, The. Apparatus for heating electrically conductive flowable media. 4,434,357, Cl. 219-291.000.
Singer Company, The: *See*—
Koosha, Mansour, 4,433,824, Cl. 248-662.000.
Minalga, Philip F., 4,433,817, Cl. 242-134.000.
Singhal, Gopal H.; and Nadkarni, Ramachandra A., to Exxon Research and Engineering Co. Recovery of catalyst from coal liquefaction residues. 4,434,043, Cl. 208-10.000.
SKF Kugellagerfabriken GmbH: *See*—
Brandenstein, Manfred; Hans, Ruiger; Horling, Peter; Hetterich, Hermann; Pape, Gebhard; and Gossmann, Willi, 4,433,932, Cl. 403-261.000.
Olschewski, Armin; Brandenstein, Manfred; Walter, Lothar; and Kunkel, Heinrich, 4,433,768, Cl. 192-98.000.

Walter, Lothar; Brandenstein, Manfred; Ernst, Horst M.; and Olschewski, Armin, 4,433,875, Cl. 308-6.00R.
SKF Steel Engineering AB: *See*—
Edstrom, John O.; and Gorling, Karl G., 4,434,001, Cl. 75-3.000.
Skiscim, Ronald J., to Celanese Corporation. Phosphate esters of acrylated epoxides. 4,434,278, Cl. 525-531.000.
Skoutas, Olgerts, to Dow Corning Corporation. Bonding silicone rubber. 4,434,195, Cl. 427-387.000.
Slack, Gerald F.: *See*—
Fellman, Robert P.; Hurwitz, Marvin J.; Myers, Robert M.; and Slack, Gerald F., 4,433,958, Cl. 433-199.000.
Slaterpryce, Allen A.: *See*—
Rosa, Hugh E.; and Slaterpryce, Allen A., 4,433,595, Cl. 74-813.00L.
Slaugh, Lynn H.; and Willis, Carl L., to Shell Oil Company. CO_2 Removal from gaseous streams. 4,433,981, Cl. 55-59.000.
Smies, Frederic D.: *See*—
Chao, Tai S.; Smith, Aubrey C., Jr.; and Smies, Frederic D., 4,434,064, Cl. 252-29.000.
Smirl, Richard L., to Borg-Warner Corporation. Variable pulley transmission. 4,433,594, Cl. 74-689.000.
Smith, Aubrey C., Jr.: *See*—
Chao, Tai S.; Smith, Aubrey C., Jr.; and Smies, Frederic D., 4,434,064, Cl. 252-29.000.
Smith, Brian S.: *See*—
Russell, Graeme E.; and Smith, Brian S., 4,433,942, Cl. 405-215.000.
Smith, David M., to Comalco Limited. High strength wear resistant aluminium alloys and process. 4,434,014, Cl. 148-3.000.
Smith, Harris W., to Hunter Investment Company. Heat exchanger. 4,433,645, Cl. 122-136.00R.
Smith International, Inc.: *See*—
Lavender, Gerry R.; and Chance, James O., Jr., 4,434,125, Cl. 264-262.000.
Smith, Jerry R., to Innovative Research. Interchangeable ball hitch. 4,433,854, Cl. 280-511.000.
Smith, John G.: *See*—
Gordon, Robert L.; and Smith, John G., 4,433,808, Cl. 229-43.000.
Smith, Joseph L., Jr.: *See*—
Deis, Daniel W.; McNab, Ian R.; and Smith, Joseph L., Jr., 4,433,608, Cl. 89-8.000.
Smith, Lindsay K.; and Yabsley, Michael A., to ICI Australia Limited. Explosive composition. 4,434,017, Cl. 149-2.000.
Smith, Raymond H. Apparatus and method for recovering atmospheric moisture. 4,433,552, Cl. 62-93.000.
Smith, Robert W., to Allied Corporation. Modular apparatus for casting metal strip. 4,433,715, Cl. 164-423.000.
Smith, Terrence R.: *See*—
Strolle, Christopher H.; and Smith, Terrence R., 4,434,437, Cl. 358-140.000.
Smiths Industries Public Limited Company: *See*—
Lane, Michael J., 4,434,402, Cl. 324-393.000.
Smitley, George P.: *See*—
Robinson, Keith D.; and Smitley, George P., 4,434,021, Cl. 156-242.000.
SMS Schloemann-Siemag Aktiengesellschaft: *See*—
Spielvogel, Harry; and Schedler, Heinz, 4,433,612, Cl. 91-514.000.
Streubel, Hans, 4,433,716, Cl. 164-448.000.
Sneed, Elmore C.: *See*—
Wilkinson, Randolph N., III; Sneed, Elmore C.; and Mueller, Janet M., 4,434,136, Cl. 422-263.000.
Snell, William W., Jr.: *See*—
Gans, Michael J.; and Snell, William W., Jr., 4,434,405, Cl. 330-149.000.
Snow Brand Milk Products Co., Ltd.: *See*—
Izutsu, Tadashi; Koutake, Masanobu; Hiraoka, Yasunobu; Takafuji, Shin-ichi; Yamada, Tamotsu; Kurosawa, Seiji; and Satoh, Tetsuo, 4,433,618, Cl. 99-455.000.
Snow, Ralph K., Jr., to Schaevitz Engineering. Non-contacting gage tip pad. 4,433,571, Cl. 73-37.500.
Snyder, Jeffrey T.: *See*—
Lindsay, Erin J.; and Snyder, Jeffrey T., 4,433,971, Cl. 604-122.000.
Societe Anonyme dite: Delas-Weir: *See*—
Andrieux, Bernard, 4,433,546, Cl. 60-691.000.
Societe Vetrotex Saint-Gobain: *See*—
Melan, Giuseppe; Verdet, Pierre; and Besenval, Christian, 4,433,991, Cl. 65-1.000.
Solex Research Corporation of Japan: *See*—
Watanabe, Morio; and Nishimura, Sanji, 4,434,002, Cl. 75-0.5AA.
Somezawa, Masashi: *See*—
Nakajima, Kaoru; Ninomiya, Yoshinobu; and Somezawa, Masashi, 4,434,210, Cl. 428-447.000.
Sommer, Robert C., to American Systems Corporation. Radio receiver with audio selectivity. 4,434,508, Cl. 455-306.000.
Somrack, Lawrence A.: *See*—
Malish, Terrance J.; and Somrack, Lawrence A., 4,433,931, Cl. 403-194.000.
Sone, Masazumi: *See*—
Ishikawa, Yasuki; Endo, Hiroshi; Sone, Masazumi; and Imai, Iwao, 4,433,669, Cl. 123-620.000.
Sony Corporation: *See*—
Baba, Yasuharu; and Takeda, Masashi, 4,434,408, Cl. 331-111.000.
Nakajima, Kaoru; Ninomiya, Yoshinobu; and Somezawa, Masashi, 4,434,210, Cl. 428-447.000.
Uedaira, Satoru; Shimizu, Hidetoshi; Tamura, Hidemasa; Taguchi, Hiromichi; Yamanoi, Hiroshi; and Makino, Yoshimi, 4,434,202, Cl. 428-143.000.
Sorbie, Thomas B.: *See*—
Riggs, Darius O.; and Sorbie, Thomas B., 4,433,785, Cl. 209-531.000.
South Louisiana Contractors: *See*—
Hebert, Francis A., 4,433,464, Cl. 29-252.000.
Southerland, Stephen R.: *See*—
Huffman, Charles E.; and Southerland, Stephen R., 4,434,485, Cl. 370-55.000.
Spainhour, Carroll D., to Western Electric Co., Inc. Method of heating a lightguide preform. 4,433,970, Cl. 431-8.000.
Spann, Donald C. Disposable orthopedic support. 4,433,678, Cl. 128-80.00A.
Sparks, Moses, Jr.: *See*—
Lenox, Ronald S.; and Sparks, Moses, Jr., 4,434,007, Cl. 106-26.000.
Sparton Corporation: *See*—
Neese, James A., 4,433,750, Cl. 181-179.000.
Spath, Werner: *See*—
Hoerschelmann, Konstantin; Kausche, Helmold; and Spath, Werner, 4,434,036, Cl. 204-164.000.
Spaulding, Lawrence D.: *See*—
Holtzberg, Matthew W.; and Spaulding, Lawrence D., 4,433,652, Cl. 123-188.0AA.
Holtzberg, Matthew W.; Henke, Steven J.; and Spaulding, Lawrence D., 4,433,964, Cl. 474-152.000.
Spence, Gavin G.: *See*—
Maslanka, William W.; and Spence, Gavin G., 4,434,267, Cl. 524-458.000.
Sperry Corporation: *See*—
Bohman, Carl E., 4,433,528, Cl. 56-10.200.
Swartz, Harold L.; Atkeisson, Randal A.; Carter, Rodney A.; and Parker, Russell C., 4,434,391, Cl. 318-662.000.
Spiegelman, Gerald; and Liauw, Koei-Liang, to Witco Chemical Corporation. Preparation of mixtures of methyltin trichloride and dimethyltin dichloride from stanic chloride and dimethyltin dichloride without catalyst and conversion to mixed methyltin mercaptide stabilizers. 4,434,102, Cl. 260-429.700.
Spiegelman, Stanley R.; Salton, Robert B.; Beer, Robert W.; Malandra, Louis J.; and Cognevich, Michael L., to Westinghouse Electric Corp. Reactor vessel stud closure system. 4,433,828, Cl. 254-29.00A.
Spielvogel, Harry; and Schedler, Heinz, to SMS Schloemann-Siemag Aktiengesellschaft. Safety control device for protecting hydraulically held loads against uncontrolled pressure overloading. 4,433,612, Cl. 91-514.000.
Spinner, Joseph R., to King-Seeley Thermos Co. Ice making apparatus. 4,433,559, Cl. 62-354.000.
Spirk, Herbert: *See*—
Miedaner, Horst; and Spirk, Herbert, 4,433,523, Cl. 52-592.000.
Spittaler, Gunther: *See*—
Beriger, Conrad; Kucera, Ladislav; Schneider, Paul; and Spittaler, Gunther, 4,434,417, Cl. 338-53.000.
Spongr, Jerry J.; Tiebor, John E.; and Ivasyuk, Boris N., to Twin City International, Inc. Apparatus for measuring coating thickness. 4,434,366, Cl. 250-308.000.
Sprout, Oliver S., Jr., to Pennwalt Corporation. Production of wrinkle-free piezoelectric films by poling. 4,434,114, Cl. 264-22.000.
Spurr, Orson K., Jr.: *See*—
Burhans, Allison S.; and Spurr, Orson K., Jr., 4,434,286, Cl. 528-297.000.
Stake, Dennis G.: *See*—
Anderson, Gary W.; and Stake, Dennis G., 4,433,622, Cl. 101-40.000.
Stamicarbon B.V.: *See*—
De Munck, Nicolaas A.; and Scholten, Joseph J. F., 4,434,302, Cl. 568-454.000.
Dorrestijn, Antoon; Lemstra, Pieter J.; and Van Unen, Lambert H. T., 4,434,252, Cl. 521-134.000.
van de Leemput, Lambertus J. M. A.; and Nooijen, Godefridus A. H., 4,434,083, Cl. 502-154.000.
Standard Oil Company: *See*—
Holtzberg, Matthew W.; and Spaulding, Lawrence D., 4,433,652, Cl. 123-188.0AA.
Holtzberg, Matthew W.; Henke, Steven J.; and Spaulding, Lawrence D., 4,433,964, Cl. 474-152.000.
Trushenski, Scott P., 4,433,730, Cl. 166-274.000.
Standard Oil Company (Indiana): *See*—
Hensley, Albert L., Jr.; Nevitt, Thomas D.; and Tait, A. Martin, 4,434,047, Cl. 208-111.000.
Kuhlmann, George E.; and Hoover, Stephen V., 4,434,244, Cl. 502-209.000.
Serres, Carl; and Schaffhausen, John G., 4,434,270, Cl. 524-570.000.
Staritzbichler, Werner: *See*—
Dworak, Gert; and Staritzbichler, Werner, 4,434,256, Cl. 523-402.000.
Stauffer Chemical Company: *See*—
Hyzak, Daniel L., 4,433,999, Cl. 71-100.000.
Lin, Ruey Y., 4,434,118, Cl. 264-109.000.
Mahoney, Martin D.; Gaughan, Edmund J.; Pallos, Ferenc M.; and Lam, Hsiao-Ling, 4,434,000, Cl. 71-103.000.
Pallos, Ferenc M., 4,433,997, Cl. 71-92.000.
Steckler, Steven A.; and Balaban, Alvin R., to RCA Corporation. Digital television AGC arrangement. 4,434,439, Cl. 358-174.000.
Steel, James, to Ogden Electronics Ltd. Vehicle speed control. 4,433,746, Cl. 180-171.000.
Steeve, Edward J. Geometric weedless fishhook assembly. 4,433,502, Cl. 43-43.200.

Stegemeyer, Horst: *See*—
Sucrow, Wolfgang; Murawski, Hans-Rudiger; Minas, Hermann; and Stegemeyer, Horst, 4,434,073, Cl. 252-299.620.
Stenzel, Wolfgang, to Beiersdorf Aktiengesellschaft. Pyrimidyl thioureas useful for the treatment of hypertension and hyperlipidemia. 4,434,167, Cl. 424-251.000.
Stephenson, Stanley V.: *See*—
Cox, Bruce M.; and Stephenson, Stanley V., 4,433,701, Cl. 137-101.190.
Stewart, David C.: *See*—
Perry, William H.; Stewart, David C.; and Waterworth, Geoffrey, 4,433,867, Cl. 296-146.000.
Stewart, Roger G., to RCA Corporation. Sense amplifiers. 4,434,381, Cl. 307-530.000.
Stirling, Robert: *See*—
Simpson, David P.; and Stirling, Robert, 4,434,357, Cl. 219-291.000.
Stirling, William L.: *See*—
Dagenhart, William K.; Haselton, Halsey H.; Stirling, William L.; and Whealton, John H., 4,434,131, Cl. 376-130.000.
Stockinger, Richard W.: *See*—
Marino, Vincent E.; Nicola, Robert J.; Maier, Karl; and Stockinger, Richard W., 4,433,890, Cl. 339-97.00C.
Stoffel Seals Corporation: *See*—
Bienz, Hans, 4,433,498, Cl. 40-2.00R.
Stojanowski, John S. Bi-annulus rotary engine. 4,433,658, Cl. 123-221.000.
Stoll, Wolfgang; and Ledebrink, Wilhelm, to Alkem GmbH. Method for dissolving hard-to dissolve nuclear fuels. 4,434,137, Cl. 423-6.000.
Stone Container Corporation: *See*—
Lopes, Richard R., 4,433,774, Cl. 198-689.000.
Stone & Webster Engineering Corp.: *See*—
Gartside, Robert J.; and Woebcke, Herman N., 4,433,984, Cl. 55-196.000.
Stork Friesland B.V.: *See*—
Eversdijk, Bastiaan P., 4,434,027, Cl. 159-47.100.
Stratton, Thomas A. Apparatus for manipulating snap rings. 4,433,462, Cl. 29-229.000.
Streib, Stephen F., to Chevron Research Company. Ultrasensitive apparatus and method for detecting change in fluid flow conditions and relief flowlines associated with a chemical or refinery complex. 4,434,418, Cl. 340-606.000.
Streubel, Hans, to SMS Schloemann-Siemag Aktiengesellschaft. Roller apron for the withdrawal and/or straightening region of a continuous casting installation for strands. 4,433,716, Cl. 164-448.000.
Stritmater, August W.: *See*—
Mendel, Jack M.; Bomgardner, Carl C.; Rack, Robert W.; Scott, Donald G.; and Stritmater, August W., 4,433,917, Cl. 366-132.000.
Strolle, Christopher H.; and Smith, Terrence R., to RCA Corporation. Generating angular coordinate of raster scan of polar-coordinate addressed memory. 4,434,437, Cl. 358-140.000.
Strother, Fleetwood E.: *See*—
Salmon, Joe E.; Strother, Fleetwood E.; and Crawford, James R., 4,433,454, Cl. 19-55.00R.
Subramanian, Krishnamoorthy: *See*—
Ezis, Andre; Samanta, Shyam K.; and Subramanian, Krishnamoorthy, 4,434,238, Cl. 501-98.000.
Sucrow, Wolfgang; Murawski, Hans-Rudiger; Minas, Hermann; and Stegemeyer, Horst, to Merck Patent Gesellschaft mit beschrankter Haftung. Perhydrophenanthrene derivatives, their preparation, and their use in liquid-crystalline dielectrics and electro-optical display elements. 4,434,073, Cl. 252-299.620.
Sugita, Hiroshi; Tsuda, Yasuo; Ito, Kenji; and Shimba, Satoru, to Konishiroku Photo Industry Co., Ltd. Light-sensitive silver halide color photographic material. 4,434,225, Cl. 430-544.000.
Sugitani, Yuji: *See*—
Nomura, Hirokazu; Sugitani, Yuji; and Suzuki, Yasuo, 4,434,352, Cl. 219-125.120.
Sugiura, Takeo: *See*—
Kohira, Takeo; Taguchi, Takao; Sugiura, Takeo; and Ohta, Takatoshi, 4,434,223, Cl. 430-273.000.
Sukegawa, Tsuneo: *See*—
Takahashi, Yosuke; Akasaka, Hideki; Kasui, Toshikatsu; Niwa, Tatsuo; and Sukegawa, Tsuneo, 4,433,901, Cl. 350-357.000.
Sullivan, John L.: *See*—
Giorgini, Eugene A.; and Sullivan, John L., 4,433,685, Cl. 128-204.260.
Sulzer Brothers Limited: *See*—
Biaggi, Armando, 4,433,721, Cl. 165-162.000.
Sumino, Fumio, to Canon Kabushiki Kaisha. Electrophotographic photosensitive member comprising photoconductive powder and a deionized binder resin. 4,434,219, Cl. 430-96.000.
Sumitomo Chemical Company, Limited: *See*—
Narisawa, Shizuo; Taira, Yoshito; Yoshii, Yuuji; and Kondou, Tomizou, 4,434,257, Cl. 524-5.000.
Sunada, Yoichi: *See*—
Takahashi, Yoshikazu; Sunada, Yoichi; Tokuhara, Toshiharu; and Takitani, Masaru, 4,434,081, Cl. 502-154.000.
Sundeen, Arthur R., to General Motors Corporation. Engine operation related event timing system. 4,433,572, Cl. 73-116.000.
Survival Technology, Inc.: *See*—
Sarnoff, Stanley J.; Malooley, Rudolph S.; Calkins, George B.; and Tarello, William R., 4,433,684, Cl. 128-203.210.
Suss, Hans G.: *See*—
Friedli, Paul; and Suss, Hans G., 4,434,466, Cl. 364-200.000.
Suzuki, Hitoshi; Takahashi, Shigekatsu; and Fujioka, Yoshiki, to Hitachi, Ltd. Memory protection system for effecting alteration of protection information without intervention of control program. 4,434,464, Cl. 364-200.000.
Suzuki, Kenji: *See*—
Tsuchiya, Shuji; Ikeda, Hisao; and Suzuki, Kenji, 4,434,104, Cl. 260-456.00P.
Suzuki, Kouichi; and Mori, Kazuyuki, to Nissan Motor Company, Limited. Automatic speed control system for an automotive vehicle. 4,434,469, Cl. 364-426.000.
Suzuki, Shogo, to Furukawa Denchi Kabushiki Kaisha. Alkaline storage battery. 4,434,214, Cl. 429-59.000.
Suzuki, Takayuki: *See*—
Kojima, Masaaki; Suzuki, Takayuki; and Abe, Hiromichi, 4,433,897, Cl. 350-252.000.
Suzuki, Takeshi: *See*—
Amano, Katsuhisa; Kumagai, Tadashi; Masaki, Akio; Shimada, Shinichi; Suzuki, Takeshi; and Ohtaka, Shoichi, 4,433,541, Cl. 60-293.000.
Suzuki, Yasuo; Nagata, Shuji; Nonaka, Takashiro; and Murakami, Tadashi, to Nippon Steel Corporation. Process for bow type continuous casting. 4,433,717, Cl. 164-454.000.
Suzuki, Yasuo: *See*—
Nomura, Hirokazu; Sugitani, Yuji; and Suzuki, Yasuo, 4,434,352, Cl. 219-125.120.
Suzuki, Yoshiki: *See*—
Sekine, Kunio; Suzuki, Yoshiki; Yamashita, Gentaro; and Yamaguchi, Hisao, 4,434,159, Cl. 424-178.000.
Suzuki, Yoshitsugu; Iizuka, Syogo; Kajiyama, Shigeo; Usui, Kenji; and Kobayashi, Masahiro, to Yazaki Corporation. Method of making a wire harness. 4,433,479, Cl. 29-825.000.
Swaim, Dennis L. Convertible trailer hitch. 4,433,853, Cl. 280-415.00R.
Swain, Jon M. Mobile abrasive blasting surface treating apparatus. 4,433,511, Cl. 51-424.000.
Swann, Wayne E., to Genex Corporation. Immobilization of biological materials in condensed polyalkyleneimine polymers. 4,434,228, Cl. 435-108.000.
Swartz, Harold L.; Atkeisson, Randal A.; Carter, Rodney A.; and Parker, Russell C., to Sperry Corporation. Capacitive feedback transducer and closed loop instrument meter mechanism. 4,434,391, Cl. 318-662.000.
Swift, Harold E.; and Lunden, Richard W., to Gulf Research & Development Company. Polymerizing olefins with a novel catalyst. 4,434,281, Cl. 526-119.000.
Swinney, Glen E. Painter's caddy. 4,433,801, Cl. 224-148.000.
Sydansk, Robert D.; and Gucwa, Paul R., to Marathon Oil Company. Process for selectively reducing the fluid injection rate or production rate of a well. 4,433,728, Cl. 166-270.000.
Sydansk, Robert D., to Marathon Oil Company. Process for selectively reducing the fluid injection rate or production rate of a well. 4,433,729, Cl. 166-270.000.
Symons Corporation: *See*—
Schimmel, Vernon R., 4,433,826, Cl. 249-38.000.
Szalai nee Barta, Gizella: *See*—
Lempert, Karoly; Harsanyi, Kalman; Doleschall, Gabor; Hornyak, Gyula; Nyitrai, Jozsef; Zauer, Karoly; Fetter, Jozsef; Simig, Gyula; Gombos nee Visky, Zsuzsanna; and Szalai nee Barta, Gizella, 4,434,099, Cl. 260-239.00A.
Szekely, Eugen: *See*—
Rabi, Tavassa; and Szekely, Eugen, 4,434,235, Cl. 436-110.000.
Szpur, Roman. Method of mounting medical electrode assembly. 4,433,481, Cl. 29-878.000.
T.K.S. (Aircraft De-Icing) Limited: *See*—
Humphreys, Bryan E., 4,434,201, Cl. 428-137.000.
Tabara, Takashi, to Olympus Optical Company Limited. Measuring vessels analysis utilizing fixed enzyme. 4,434,232, Cl. 435-288.000.
Tabe, Takayuki; and Shinbori, Takeyoshi, to NHK Spring Co., Ltd. Apparatus for controlling the spring constant of a laminated leaf spring assembly. 4,433,833, Cl. 267-18.000.
Tadauchi, Yukio: *See*—
Tanaka, Atsuyuki; Kojima, Hiroaki; Kaieda, Shozo; Kakiuchi, Tokuji; Nishioka, Nobuaki; Tadauchi, Yukio; and Nakagami, Hidekazu, 4,434,503, Cl. 382-48.000.
Taenzer, Jon C.: *See*—
Green, Philip S.; and Taenzer, Jon C., 4,433,690, Cl. 128-660.000.
Taguchi, Hiromichi: *See*—
Uedaira, Satoru; Shimizu, Hidetoshi; Tamura, Hidemasa; Taguchi, Hiromichi; Yamanoi, Hiroshi; and Makino, Yoshimi, 4,434,202, Cl. 428-143.000.
Taguchi, Takao: *See*—
Kohira, Takeo; Taguchi, Takao; Sugiura, Takeo; and Ohta, Takatoshi, 4,434,223, Cl. 430-273.000.
Tahara, Kazutoki: *See*—
Sado, Ryoichi; and Tahara, Kazutoki, 4,433,887, Cl. 339-17.00R.
Taira, Yoshito: *See*—
Narisawa, Shizuo; Taira, Yoshito; Yoshii, Yuuji; and Kondou, Tomizou, 4,434,257, Cl. 524-5.000.
Tait, A. Martin: *See*—
Hensley, Albert L., Jr.; Nevitt, Thomas D.; and Tait, A. Martin, 4,434,047, Cl. 208-111.000.
Takafuji, Shin-ichi: *See*—
Izutsu, Tadashi; Koutake, Masanobu; Hiraoka, Yasunobu; Takafuji, Shin-ichi; Yamada, Tamotsu; Kurosawa, Seiji; and Satoh, Tetsuo, 4,433,618, Cl. 99-455.000.
Takagi, Shigeji: *See*—
Andoh, Tetsuji; Takagi, Shigeji; and Sakamoto, Takeshi, 4,433,472, Cl. 29-596.000.

Takahashi, Katsuyu: *See—*
Fujimura, Takashi; and Takahashi, Katsuyu, 4,433,994, Cl. 65-110.000.

Takahashi, Shigekatsu: *See—*
Suzuki, Hitoshi; Takahashi, Shigekatsu; and Fujioka, Yoshiki, 4,434,464, Cl. 364-200.000.

Takahashi, Soroku, to Kyuroku Corporation. Single fluke anchor. 4,433,635, Cl. 114-301.000.

Takahashi, Takao; Ohnishi, Kimimasa; and Wakai, Sinzi, to Nissan Motor Co., Ltd. Weft inserting nozzle of an air jet type weaving loom. 4,433,706, Cl. 139-435.000.

Takahashi, Yoshikazu; Sunada, Yoichi; Tokuhara, Toshiharu; and Takitani, Masaru, to Toyo Stauffer Chemical Co., Ltd. Titanium trichloride catalytic component and homo- or co-polymerization of α-olefin. 4,434,081, Cl. 502-154.000.

Takahashi, Yosuke; Akasaka, Hideki; Kasui, Toshikatsu; Niwa, Tatsuo; and Sukegawa, Tsuneo, to Nippon Kogaku K.K. All solid type electrochromic display element. 4,433,901, Cl. 350-357.000.

Takaoka, Michio: *See—*
Gomi, Yoshiaki; Hirata, Takahiro; Takaoka, Michio; Mohtai, Tsuneaki; and Akashi, Kazuya, 4,434,319, Cl. 174-13.000.

Takara Co., Ltd.: *See—*
Terui, Masumi, 4,433,504, Cl. 46-11.000.

Takasago Perfumery Co., Ltd.: *See—*
Kobayashi, Toyohiko; and Tsuruta, Haruki, 4,434,306, Cl. 568-820.000.

Takeda, Akitsu: *See—*
Yoshikawa, Akira; Takeda, Akitsu; Ochi, Osamu; Hisaki, Tomoko; and Mizushima, Yoshihiko, 4,434,224, Cl. 430-323.000.

Takeda Machinery Works Company, Ltd.: *See—*
Ikeda, Chihiro, 4,433,600, Cl. 83-468.000.

Takeda, Masashi: *See—*
Baba, Yasuharu; and Takeda, Masashi, 4,434,408, Cl. 331-111.000.

Takeuchi, Hiroo; Hachiro, Nobuaki; and Miyazaki, Yoshihisa, to Nissin Kogyo Kabushiki Kaisha. Vacuum booster device. 4,433,614, Cl. 91-376.00R.

Takiguchi, Shinji: *See—*
Inagaki, Sanji; Takiguchi, Shinji; and Tanaka, Susumu, 4,434,355, Cl. 219-216.000.

Takimoto, Masatami: *See—*
Teramura, Mitsuyoshi; Takimoto, Masatami; Nakamura, Norihiko; Itou, Takaaki; Katou, Takashi; Yasuda, Takeru; and Kitamura, Sunao, 4,434,111, Cl. 261-44.00C.

Takitani, Masaru: *See—*
Takahashi, Yoshikazu; Sunada, Yoichi; Tokuhara, Toshiharu; and Takitani, Masaru, 4,434,081, Cl. 502-154.000.

Taller, Robert A.: *See—*
McGary, Charles W., Jr.; Pascarella, Vincent J.; Taller, Robert A.; Rhodes, Delmer R.; Anglin, Paul E.; and Daugherty, Charles W., 4,434,126, Cl. 264-303.000.

Tamagawa, Tohoru: *See—*
Yanabu, Satoru; and Tamagawa, Tohoru, 4,434,332, Cl. 200-144.0AP.

Tambourin, Pierre: *See—*
Bisagni, Emile; Ducrocq, Claire; Rivalle, Christian; Tambourin, Pierre; Wendling, Francoise; Civier, Alain; Montagnier, Luc; Chermann, Jean-Claude; Gruest, Jacqueline; and Lidereau, Rosette, 4,434,290, Cl. 546-70.000.

Tamura, Akihiko: *See—*
Ikemoto, Isao; Koiso, Junichi; Tamura, Akihiko; and Hirabayashi, Tsugio, 4,433,904, Cl. 355-3.0DD.
Tarumi, Noriyoshi; Tamura, Akihiko; and Kokiso, Masakazu, 4,434,218, Cl. 430-96.000.

Tamura, Hidemasa: *See—*
Uedaira, Satoru; Shimizu, Hidetoshi; Tamura, Hidemasa; Taguchi, Hiromichi; Yamanoi, Hiroshi; and Makino, Yoshimi, 4,434,202, Cl. 428-143.000.

Tanabe Seiyaku Co., Ltd.: *See—*
Chibata, Ichiro; Yamada, Shigeki; Hongo, Chikara; and Yoshioka, Ryuzo, 4,434,107, Cl. 260-501.120.

Tanaka, Atsuyuki; Kojima, Hiroaki; Kaieda, Shozo; Kakiuchi, Tokuji; Nishioka, Nobuaki; Tadauchi, Yukio; and Nakagami, Hidekazu, to Minolta Camera Kabushiki Kaisha. Image information output apparatus. 4,434,503, Cl. 382-48.000.

Tanaka, Ichiro; Arato, Hiroshi; and Wakabayashi, Takaaki, to Eisai Co., Ltd. Animal coccidiosis preventive. 4,434,166, Cl. 424-250.000.

Tanaka, Susumu: *See—*
Inagaki, Sanji; Takiguchi, Shinji; and Tanaka, Susumu, 4,434,355, Cl. 219-216.000.

Tanaka, Yoshio: *See—*
Watanabe, Tadaaki; and Tanaka, Yoshio, 4,433,588, Cl. 74-10.330.

Tani, Haruhisa: *See—*
Okada, Tokio; Kojima, Shigezo; Tani, Haruhisa; Kurihara, Kazuhiko; and Yazawa, Hirosi, 4,434,128, Cl. 264-560.000.

Tarello, William R.: *See—*
Sarnoff, Stanley J.; Malooley, Rudolph S.; Calkins, George B.; and Tarello, William R., 4,433,684, Cl. 128-203.210.

Tarsia, Giuseppe, to Berkey Photo, Inc. Lens alignment structure. 4,433,907, Cl. 355-55.000.

Tarsia, Giuseppe, to Berkey Photo, Inc. Transparency holder. 4,433,910, Cl. 355-76.000.

Tarumi, Noriyoshi; Tamura, Akihiko; and Kokiso, Masakazu, to Konishiroku Photo Industry Co., Ltd. Photosensitive composition for electrophotography. 4,434,218, Cl. 430-96.000.

TASA Products Limited: *See—*
Cherry, Raymond L.; Pfeiffer, Gene F.; and Maes, Randell P., 4,433,719, Cl. 165-26.000.

Tasai, Masaaki: *See—*
Kubota, Tadashi; Hamane, Tokuhito; and Tasai, Masaaki, 4,433,475, Cl. 29-736.000.

Tatro, Henry J., to Colt Industries Operating Corp. Open bolt firing mechanism for automatic firearm. 4,433,610, Cl. 89-148.000.

Tatsumi, Hisao; and Ito, Michiaki, to Tokyo Shibaura Denki Kabushiki Kaisha. Balancer for use in centrifugal rotary machine. 4,433,592, Cl. 74-573.00F.

Taylor, Carl D., to General Electric Company. Luminaire birdshield. 4,434,456, Cl. 362-374.000.

Taylor, Edward F.; and O'Kane, James C., to General Motors Corporation. Passive belt responsive to seat occupancy. 4,433,858, Cl. 280-802.000.

Taylor, Robert N. Wave energy converter. 4,434,375, Cl. 290-53.000.

Teare, John W. Method for producing concrete panels. 4,434,119, Cl. 264-145.000.

Teche, Andre: *See—*
Martel, Jacques; Tessier, Jean; and Teche, Andre, 4,434,294, Cl. 549-65.000.

Technar, Inc.: *See—*
Bell, Lon E.; and Gruber, William P., 4,434,414, Cl. 337-102.000.

Teijin Limited: *See—*
Sekine, Kunio; Suzuki, Yoshiki; Yamashita, Gentaro; and Yamaguchi, Hisao, 4,434,159, Cl. 424-178.000.

Tektronix, Inc.: *See—*
Palmquist, Steven R.; Chapman, David D.; and Hoeren, Gerd H., 4,434,488, Cl. 371-15.000.

Telediffusion de France: *See—*
Mathieu, Michel, 4,434,498, Cl. 375-114.000.

Teledyne Industries, Inc.: *See—*
Kates, James M., 4,434,482, Cl. 369-230.000.

Temp-Control Corporation: *See—*
Brady, Welby D., 4,433,556, Cl. 62-293.000.

Tencor Instruments: *See—*
Wheeler, William R., 4,433,835, Cl. 269-14.000.

Terakura, Yukio: *See—*
Ikemoto, Kazuhito; Katayama, Nobuaki; Terakura, Yukio; and Sasaki, Kan, 4,433,593, Cl. 74-606.00R.

Teramura, Mitsuyoshi; Takimoto, Masatami; Nakamura, Norihiko; Itou, Takaaki; Katou, Takashi; Yasuda, Takeru; and Kitamura, Sunao, to Toyota Jidosha Kabushiki Kaisha; and Aisan Industry Co., Ltd. Variable venturi-type carburetor. 4,434,111, Cl. 261-44.00C.

Teranishi, Takao: *See—*
Amano, Matsuo; Teranishi, Takao; Mouri, Yasunori; Abe, Osamu; and Sasayama, Takao, 4,433,650, Cl. 123-179.00G.

Terao, Motoyasu; Horigome, Shinkichi; Mitsuya, Munehisa; Ota, Sakae; and Shigematsu, Kazuo, to Hitachi, Ltd. Information recording member and method of fabricating the same. 4,434,429, Cl. 346-135.100.

Teraoka, Masao, to Tochigi-Fuji Sangyo Kabushiki Kaisha. Bi-directional overrunning clutch. 4,433,766, Cl. 192-50.000.

Terasaki, Syuuzi: *See—*
Sasaki, Tohru; Ohta, Mitsuru; Terasaki, Syuuzi; and Kakizaki, Syozo, 4,434,209, Cl. 428-416.000.

Terui, Masumi, to Takara Co., Ltd. Container and start apparatus for toy cars. 4,433,504, Cl. 46-11.000.

Teshima, Minoru: *See—*
Isobe, Minoru; Kikuchi, Hiroshi; Teshima, Minoru; Kodama, Tadasi; and Iwama, Mitsuo, 4,433,926, Cl. 400-124.000.

Teshirogi, Takuma, to Dainippon Ink and Chemicals, Inc. Polyphenylene-type polymeric compound and process for production thereof. 4,434,285, Cl. 528-86.000.

Tessier, Jean: *See—*
Martel, Jacques; Tessier, Jean; and Teche, Andre, 4,434,294, Cl. 549-65.000.

Tetra Pak International AB: *See—*
Kjelgaard, Tom, 4,433,784, Cl. 206-617.000.

Texaco Canada Resources Ltd.: *See—*
Livesey, Declan B.; and Toma, Petre, 4,434,054, Cl. 210-484.000.

Texaco Inc.: *See—*
Carrier, Robert C.; and Allen, Billy R., 4,433,977, Cl. 44-60.000.
Larkin, John M.; Watts, Lewis W., Jr.; and Marquis, Edward T., 4,434,308, Cl. 585-10.000.
Larkin, John M.; and Brader, Walter H., Jr., 4,434,309, Cl. 585-10.000.
Lin, Jiang-Jen, 4,434,248, Cl. 518-700.000.
Powell, Justin C., 4,434,071, Cl. 252-182.000.
Simons, Leslie H., 4,434,246, Cl. 518-700.000.

Texas Instruments Incorporated: *See—*
Baboian, Robert; and Haynes, Gardner S., 4,434,039, Cl. 204-196.000.
Frazier, Gary A., 4,433,896, Cl. 350-96.210.
Guttag, Karl M.; and Vanaken, Jerry R., 4,434,462, Cl. 364-200.000.
McDonough, Kevin C.; Hayn, John W.; and Bellay, Jeffrey D., 4,434,465, Cl. 364-200.000.
Ott, Granville E., 4,433,604, Cl. 84-1.190.
Woosley, Alan H.; and Masten, Billy R., 4,434,360, Cl. 235-472.000.

Th. Goldschmidt AG: *See—*
Dumm, Heinz; Koerner, Gotz; Krakenberg, Manfred; Rott, Hans; and Schmidt, Gunter, 4,434,008, Cl. 106-271.000.

Theeuwes, Felix: *See—*
Urquhart, John; and Theeuwes, Felix, 4,434,153, Cl. 424-22.000.

Theodor Wuppermann GmbH: *See*—
Preller, Hans, 4,433,565, Cl. 72-177.000.

Thomas, Alfred W.; and Heibel, Helmut, to Lucas Industries Limited. Power-operated booaters. 4,433,543, Cl. 60-547.100.

Thomas, Elmer L., to Chevron Research Company. Free standing transmitting microphone. 4,434,507, Cl. 455-95.000.

Thomas, Robert C.; Hornbuckle, John A.; and Fatka, Richard J., to Bendix Corporation, The. Speed measurement system with means for calculating the exact time period of a known quantity of speed pulses. 4,434,470, Cl. 364-565.000.

Thomas, Rudolf: *See*—
Heinemann, Ulrich; Thomas, Rudolf; Lantzsch, Reinhard; Ditgens, Klaus; and Weber, Erhard, 4,434,292, Cl. 548-373.000.

Thomas, Thomas: *See*—
Seyedin, Saeid; and Thomas, Thomas, 4,434,094, Cl. 260-112.00R.

Thompson, Gregory J.: *See*—
Lomas, David A.; and Thompson, Gregory J., 4,434,245, Cl. 502-2.000.

Thomson-CSF: *See*—
Bert, Georges, 4,434,379, Cl. 307-448.000.
Puech, Claude; Papuchon, Michel; and Arditty, Herve, 4,433,895, Cl. 350-96.130.

Thor, Charles C. Power transmission mechanism. 4,433,767, Cl. 192-67.00P.

Thorsen, Niels P., to Danfoss A/S. Defroster for a refrigerator. 4,433,555, Cl. 62-154.000.

Tiebor, John E.: *See*—
Spongr, Jerry J.; Tiebor, John E.; and Ivasyuk, Boris N., 4,434,366, Cl. 250-308.000.

Timperman, Michael R.: *See*—
Craig, Timothy P.; Pettit, John W.; and Timperman, Michael R., 4,434,356, Cl. 219-216.000.

Tinsley, John M.: *See*—
Chatterji, Jiten; Brake, Bobby G.; and Tinsley, John M., 4,433,731, Cl. 166-293.000.

Tippins, George W.; and Ginzburg, Vladimir B., to Tippins Machinery Company, Inc. Close coupled reversing rougher and finishing train and method of rolling. 4,433,566, Cl. 72-229.000.

Tippins Machinery Company, Inc.: *See*—
Tippins, George W.; and Ginzburg, Vladimir B., 4,433,566, Cl. 72-229.000.

Toa Nenryo Kogyo Kabushiki Kaisha: *See*—
Fujii, Shigeo; Ikeda, Tokuzo; Mikami, Takashi; and Okano, Shuji, 4,434,205, Cl. 428-218.000.

Tochigi-Fuji Sangyo Kabushiki Kaisha: *See*—
Teraoka, Masao, 4,433,766, Cl. 192-50.000.

Toda, Minoru; and Shima, Eiji, to RCA Corporation. Traveling wave surface acoustic wave transducer. 4,434,481, Cl. 369-132.000.

Todt, William H.: *See*—
Goldstein, Norman P.; and Todt, William H., 4,434,370, Cl. 250-370.000.

Tojza, Roman A.: *See*—
Hooker, Donald E.; and Tojza, Roman A., 4,433,844, Cl. 273-143.00R.

Tokoro, Masayoshi: *See*—
Abe, Seiko; Igashira, Toshihiko; Kawai, Hisasi; Ina, Toshikazu; and Tokoro, Masayoshi, 4,433,665, Cl. 123-552.000.

Tokuhara, Toshiharu: *See*—
Takahashi, Yoshikazu; Sunada, Yoichi; Tokuhara, Toshiharu; and Takitani, Masaru, 4,434,081, Cl. 502-154.000.

Tokuhata, Kazuo: *See*—
Sakuma, Shinzo; Yanagisawa, Hifumi; Tokuhata, Kazuo; and Miyagawa, Hiroshi, 4,434,331, Cl. 200-144.00B.

Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Fukumitsu, Akira, 4,434,480, Cl. 369-77.200.
Haramaki, Toshio; and Nakayama, Shigeru, 4,433,905, Cl. 355-3.0SH.
Kameyama, Shuichi; Kanzaki, Koichi; and Sasaki, Yoshitaka, 4,433,470, Cl. 29-577.00C.
Kawasaki, Yutaka, 4,434,333, Cl. 200-144.0AP.
Sawada, Shizuo; Ogura, Mitsugi; and Endo, Norio, 4,433,911, Cl. 355-125.000.
Tatsumi, Hisao; and Ito, Michiaki, 4,433,592, Cl. 74-573.00F.
Watanabe, Yoshihiro, 4,434,359, Cl. 235-379.000.
Yanabu, Satoru; and Tamagawa, Tohoru, 4,434,332, Cl. 200-144.0AP.

Tolman, Glen L.: *See*—
Byrne, Edmund F.; and Tolman, Glen L., 4,434,151, Cl. 424-1.100.

Toma, Petre: *See*—
Livesey, Declan B.; and Toma, Petre, 4,434,054, Cl. 210-484.000.

Tomizawa, Fumio; and Aoshika, Masayuki, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha. Cooling pipe structure for arc furnace. 4,434,495, Cl. 373-76.000.

Tommasini, Rocco M.: *See*—
Kokoszka, Joseph M.; and Tommasini, Rocco M., 4,433,584, Cl. 73-861.660.

Tonteling, Paul: *See*—
Liesch, Jean; Reiff, Nico; Reimen, Vlasta; Schmit, Romain; Schummer, Arthur; Simon, Jo; and Tonteling, Paul, 4,434,368, Cl. 250-339.000.

Top-Seal Corporation: *See*—
Owens, Edward W., 4,433,800, Cl. 222-547.000.

Toppan Printing Co., Ltd.: *See*—
Kohira, Takeo; Taguchi, Takao; Sugiura, Takeo; and Ohta, Takatoshi, 4,434,223, Cl. 430-273.000.

Toriumi, Shiro: *See*—
Nakatani, Keiji; and Toriumi, Shiro, 4,433,906, Cl. 355-55.000.

Toshmitsu, Naohiko, to Canon Kabushiki Kaisha; and Canon Denshi Kabushiki Kaisha. Magnetic head. 4,434,446, Cl. 360-125.000.

Touho, Makoto; Wada, Shigeaki; and Yamamoto, Minoru, to Matsushita Electric Works, Ltd. Discharge lamp device. 4,434,385, Cl. 313-161.000.

Toussaint, Francois, to Glaverbel. Glass manufacture. 4,433,995, Cl. 65-135.000.

Toyo Aluminium Kabushiki Kaisha: *See*—
Banba, Toshiaki, 4,434,009, Cl. 106-290.000.

Toyo Kogyo Co., Ltd.: *See*—
Yokooku, Katsuhiko, 4,433,654, Cl. 123-425.000.

Toyo Stauffer Chemical Co., Ltd.: *See*—
Takahashi, Yoshikazu; Sunada, Yoichi; Tokuhara, Toshiharu; and Takitani, Masaru, 4,434,081, Cl. 502-154.000.

Toyota Jidosha Kabushiki Kaisha: *See*—
Teramura, Mitsuyoshi; Takimoto, Masatami; Nakamura, Norihiko; Itou, Takaaki; Katou, Takashi; Yasuda, Takeru; and Kitamura, Sunao, 4,434,111, Cl. 261-44.00C.

Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
Abe, Seiko; Igashira, Toshihiko; Kawai, Hisasi; Ina, Toshikazu; and Tokoro, Masayoshi, 4,433,665, Cl. 123-552.000.
Ikemoto, Kazuhito; Katayama, Nobuaki; Terakura, Yukio; and Sasaki, Kan, 4,433,593, Cl. 74-606.00R.

Tracton, Arthur A.: *See*—
Gold, Samuel; Tracton, Arthur A.; and Rosenski, Josephine M., 4,434,259, Cl. 524-31.000.

Tragesser, Charles W., to Westinghouse Electric Corp. Circuit interrupter. 4,434,334, Cl. 200-148.00R.

Transpec, Inc.: *See*—
Manning, Donald L., 4,433,506, Cl. 49-141.000.

Trenkle, Robert W.: *See*—
Hill, Ira D.; Trenkle, Robert W.; Mookherjee, Braja D.; and Wolff, Robin K., 4,434,086, Cl. 252-522.00R.

Tri-tech, Inc.: *See*—
Geremia, Leo F., 4,434,330, Cl. 200-67.0DA.

Trigent, Inc.: *See*—
Blaul, Ronald L., 4,433,698, Cl. 134-56.00R.

Tringali, Dominick: *See*—
Parsons, James H., Jr.; Hardy-The McLain, Philippe; and Tringali, Dominick, 4,433,933, Cl. 403-268.000.

Trivette, Chester D., Jr., to Monsanto Company. Method for rubber treatment and the rubber thus treated. 4,434,266, Cl. 524-425.000.

Troutman, Ronald R.: *See*—
Cook, Herbert C.; and Troutman, Ronald R., 4,434,478, Cl. 365-185.000.

Trowbridge, Ian S., to Salk Institute for Biological Studies, The. Monoclonal antibodies specific for the human transferrin receptor glycoprotein. 4,434,156, Cl. 424-85.000.

Troxler, Franz; and Seemann, Fritz, to Sandoz Ltd. Use of 4-(2-benzoyloxy-3-tert-butylaminopropoxy)-2-methyl-indole for inducing beta-adrenoceptor blocade. 4,434,176, Cl. 424-274.000.

True, Martin E., to Weatherford/Lamb, Inc. Power pipe thread cleaner. 4,433,448, Cl. 15-88.000.

Trushenski, Scott P., to Standard Oil Company. Optimum grading of chemical concentrations in a micellar flood. 4,433,730, Cl. 166-274.000.

Tschirch, Richard P.: *See*—
Sidman, Kenneth R.; and Arons, Irving J., 4,433,439, Cl. 2-161.00R.

Tsuchiya, Shuji; Ikeda, Hisao; and Suzuki, Kenji, to Nissan Chemical Industries, Ltd. Preparation of high purity di-lower alkyl naphthalenedisulfonates. 4,434,104, Cl. 260-456.00P.

Tsuchiya, Takaoki, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Steering shaft locking device. 4,433,562, Cl. 70-186.000.

Tsuda, Yasuo: *See*—
Sugita, Hiroshi; Tsuda, Yasuo; Ito, Kenji; and Shimba, Satoru, 4,434,225, Cl. 430-544.000.

Tsujino, Yoshiki: *See*—
Ishizaki, Hiroyuki; Tsujino, Yoshiki; and Dohi, Masaji, 4,434,441, Cl. 358-213.000.

Tsukamoto, Goro; Kohno, Toshihiko; Yoshino, Koichiro; Morita, Tominori; Ito, Keizo; and Nose, Takashi, to Kanebo, Ltd. Phosphonic acid ester, pharmaceutical compositions containing the same and method of using the same. 4,434,162, Cl. 424-200.000.

Tsuruta, Haruki: *See*—
Kobayashi, Toyohiko; and Tsuruta, Haruki, 4,434,306, Cl. 568-820.000.

Tsutsumi, Akira, to Amada Engineering & Service Co. Laser beam cutting machines and the like. 4,434,349, Cl. 219-121.0LG.

Turiot, Andre, to Messier-Hispano-Bugatti (S.A.). Aircraft undercarriage. 4,433,820, Cl. 244-102.00R.

Tward, Emanuel, to Tward 2001 Limited. Pressure transducer. 4,433,580, Cl. 73-718.000.

Tward 2001 Limited: *See*—
Tward, Emanuel, 4,433,580, Cl. 73-718.000.

Twin City International, Inc.: *See*—
Spongr, Jerry J.; Tiebor, John E.; and Ivasyuk, Boris N., 4,434,366, Cl. 250-308.000.

Uchida, Yoshiaki: *See*—
Ohmori, Taiji; Kasahara, Toshio; and Uchida, Yoshiaki, 4,433,743, Cl. 180-41.000.

Udvardy, Agnes: *See*—
Horvath, Tibor; Udvardy, Agnes; David, Agoston; and Marmarosi nee Kellner, Katalin, 4,434,152, Cl. 424-19.000.

Uedaira, Satoru; Shimizu, Hidetoshi; Tamura, Hidemasa; Taguchi, Hiromichi; Yamanoi, Hiroshi; and Makino, Yoshimi, to Sony Corporation. Slide member. 4,434,202, Cl. 428-143.000.

Ueno, Masayasu: *See—*
Sakuma, Isamu; Nishida, Katsuhiko; Kawano, Hideo; Ueno, Masayasu; Matsumoto, Yoshishige; Matsumoto, Shohei; and Furuse, Takao, 4,434,491, Cl. 372-48.000.

Ulrich, Heinrich: *See—*
Ulrich, Max B.; and Ulrich, Heinrich, 4,433,677, Cl. 128-69.000.

Ulrich, Max B.; and Ulrich, Heinrich, to Ulrich, Max Bernhard. Implantable splint for correcting lumbosacral spondylodesis. 4,433,677, Cl. 128-69.000.

Ulrich, Max Bernhard: *See—*
Ulrich, Max B.; and Ulrich, Heinrich, 4,433,677, Cl. 128-69.000.

Unger, John T., to Abbott Laboratories. Immunoassay for class specific immunoglobulin antibodies. 4,434,227, Cl. 435-7.000.

Ungeringer, Gerd: *See—*
Lichtner, Emil; Ungeringer, Gerd; and Giebel, Gerhard, 4,433,653, Cl. 123-193.00H.

Union Carbide Corporation: *See—*
Burhans, Allison S.; and Spurr, Orson K., Jr., 4,434,286, Cl. 528-297.000.
Dombek, Bernard D., 4,434,247, Cl. 518-700.000.
Keogh, Michael J., 4,434,272, Cl. 525-100.000.
Lewis, Walter E. F., 4,434,066, Cl. 252-77.000.
Olszewski, Walter J., 4,433,990, Cl. 62-22.000.
Papa, Anthony J., 4,434,301, Cl. 568-366.000.

United Centrifugal Pumps: *See—*
Murray, Jack T., 4,433,598, Cl. 82-2.00E.

United States of America
Air Force: *See—*
Benard, David J.; Pchelkin, Nicholas R.; McDermott, William E.; Ellis, David E.; and Miller, George W., 4,434,492, Cl. 372-59.000.
Army: *See—*
Durenec, Peter, 4,433,550, Cl. 62-6.000.
Gaglione, Stanley; and O'Hare, James A., 4,434,426, Cl. 343-372.000.
Gutleber, Frank S., 4,434,505, Cl. 455-50.000.
Holaday, John W.; and Faden, Alan I., 4,434,168, Cl. 424-260.000.
Energy: *See—*
Dagenhart, William K.; Haselton, Halsey H.; Stirling, William L.; and Whealton, John H., 4,434,131, Cl. 376-130.000.
National Aeronautics and Space Administration: *See—*
Hale, Robert R.; and McDougal, Allan R., 4,433,672, Cl. 126-419.000.
Kavaya, Michael J.; and Menzies, Robert T., 4,434,490, Cl. 372-20.000.
Rosser, Robert W.; Chen, Timothy S.; and Cheng, Chung-Heng, 4,434,106, Cl. 260-465.50R.
Sidman, Kenneth R.; and Arons, Irving J., 4,433,439, Cl. 2-161.00R.
Wells, Ivan D.; Koh, Jin L.; and Holmes, Marvin, 4,433,544, Cl. 60-641.120.
Zaplatynsky, Isidor, 4,434,189, Cl. 427-53.100.
Navy: *See—*
Caudy, Don W.; Hackman, Donald J.; Myers, John R.; and Hoffman, Robert T., 4,433,633, Cl. 114-54.000.
DeFusco, Albert A., Jr.; Nielsen, Arnold T.; and Atkins, Ronald L., 4,434,304, Cl. 568-710.000.
Malloy, Richard J., 4,433,737, Cl. 175-5.000.

U.S. Philips Corporation: *See—*
Flisikowski, Peter; Jeglinski, Werner; and Jelmorini, Gerardus, 4,434,350, Cl. 219-121.0LC.
Kommoss, Klaus; and Schutte, Heinz, 4,434,442, Cl. 360-74.200.
Pfeiffer, Wilfried, 4,434,501, Cl. 378-187.000.
Robertson, John M.; Breed, Dirk J.; and Voermans, Antonius B., 4,434,212, Cl. 428-693.000.
Sander, Ingolf; and Hill, Bernhard, 4,434,477, Cl. 365-120.000.
Van Herk, Alfred, 4,434,445, Cl. 360-121.000.

United States Steel Corporation: *See—*
Brendlinger, Edward C., 4,434,040, Cl. 204-206.000.

United Technologies Corp.: *See—*
Kokoszka, Joseph M.; and Tommasini, Rocco M., 4,433,584, Cl. 73-861.660.
Norris, James R.; and Picard, Harrison R., 4,433,539, Cl. 60-39.080.
Shiembob, Lawrence T., 4,433,845, Cl. 277-1.000.

Universite De Montreal: *See—*
Aitcin, Pierre C., 4,434,239, Cl. 501-118.000.

University of Rochester, The: *See—*
Mourou, Gerard; Valdmanis, Janis A.; and Williamson, Steven L., 4,434,399, Cl. 324-96.000.

UOP Inc.: *See—*
Golem, Michael W., 4,434,051, Cl. 210-264.000.
Lomas, David A.; and Thompson, Gregory J., 4,434,245, Cl. 502-2.000.

Upjohn Company, The: *See—*
Adams, Lonnie D.; and Sammons, David W., 4,434,234, Cl. 436-86.000.
Gammill, Ronald B., 4,434,295, Cl. 549-344.000.
Gammill, Ronald B., 4,434,296, Cl. 549-471.000.

Urish, Joseph M.: *See—*
Apfelbeck, Otto L.; and Urish, Joseph M., 4,434,358, Cl. 219-501.000.

Urquhart, John; and Theeuwes, Felix, to Alza Corporation. Drug delivery system comprising a reservoir containing a plurality of tiny pills. 4,434,153, Cl. 424-22.000.

Uschold, Ronald E., to Du Pont de Nemours, E. I., and Company. Perfluoroketovinyl ethers and copolymers therefrom. 4,434,273, Cl. 525-326.200.

Usui, Kenji: *See—*
Suzuki, Yoshitsugu; Iizuka, Syogo; Kajiyama, Shigeo; Usui, Kenji; and Kobayashi, Masahiro, 4,433,479, Cl. 29-825.000.

Uyama, Seiichi: *See—*
Yorifuji, Yuki; Uyama, Seiichi; Fukutake, Katsuhiko; and Miyazaki, Masaharu, 4,434,363, Cl. 250-214.00B.

Vac-Tec Systems, Inc.: *See—*
Morrison, Charles F., Jr., 4,434,038, Cl. 204-192.00R.

Valdmanis, Janis A.: *See—*
Mourou, Gerard; Valdmanis, Janis A.; and Williamson, Steven L., 4,434,399, Cl. 324-96.000.

Valeo: *See—*
Darrichard, Louis D.; and Plaisant, Jacques, 4,433,535, Cl. 57-229.000.
Loizeau, Pierre; and Carmillet, Roger, 4,433,770, Cl. 192-106.200.

Valeo S.A.: *See—*
Caray, Andre, 4,433,771, Cl. 192-106.200.

Valint, Paul, Jr.: *See—*
Oswald, Alexis A.; Huang, Helen; Huang, John; and Valint, Paul, Jr., 4,434,062, Cl. 252-8.55D.

Vanaken, Jerry R.: *See—*
Guttag, Karl M.; and Vanaken, Jerry R., 4,434,462, Cl. 364-200.000.

Van Auken, John A. Electrically conductive game ball. 4,433,840, Cl. 273-61.00R.

van de Leemput, Lambertus J. M. A.; and Nooijen, Godefridus A. H., to Stamicarbon B.V. Process of preparing a catalyst component and polymerization of α-olefins with such a catalyst component. 4,434,083, Cl. 502-154.000.

van der Lely, Ary; and Bom, Cornelis J. G., to C. Van der Lely N.V. Soil cultivating implement. 4,433,734, Cl. 172-68.000.

Van Herk, Alfred, to U.S. Philips Corporation. Magnetic head for high track density. 4,434,445, Cl. 360-121.000.

Van Leirsburg, Dean A.: *See—*
Hubred, Gale L.; and Van Leirsburg, Dean A., 4,434,140, Cl. 423-54.000.
Hubred, Gale L.; and Van Leirsburg, Dean A., 4,434,141, Cl. 423-54.000.

Van Loveren, Augustinus G.: *See—*
Evers, William J.; Mookherjee, Braja D.; Van Ouwerkerk, Anton; and Van Loveren, Augustinus G., 4,434,085, Cl. 252-522.00R.

Van Ouwerkerk, Anton: *See—*
Evers, William J.; Mookherjee, Braja D.; Van Ouwerkerk, Anton; and Van Loveren, Augustinus G., 4,434,085, Cl. 252-522.00R.

Van Steenwyk, Brett H.: *See—*
Ott, Paul W.; Engebretson, Harold J.; LaHue, Philip M.; and Van Steenwyk, Brett H., 4,433,491, Cl. 33-302.000.

Van Unen, Lambert H. T.: *See—*
Dorrestijn, Antoon; Lemstra, Pieter J.; and Van Unen, Lambert H. T., 4,434,252, Cl. 521-134.000.

Van Wyk, Richard; and Eisenberg, James, to Vienna Sausage Manufacturing Company. Apparatus for branding meat or meat products. 4,433,621, Cl. 101-11.000.

Varga, Laszlo: *See—*
Keszei, Jeno; Varga, Laszlo; and Donath, Jeno, 4,433,485, Cl. 33-3.00R.

Vasicek, Vladimir: *See—*
Cech, Miloslav; Kuda, Vladimir; and Vasicek, Vladimir, 4,433,705, Cl. 139-435.000.

Vaughan & Bushnell Manufacturing Co.: *See—*
Porter, Lawrence W., 4,433,709, Cl. 145-2.00R.

Veazey, Richard L.: *See—*
Roling, Paul V.; Veazey, Richard L.; and Aylward, David E., 4,434,242, Cl. 502-107.000.

Vectra International Corporation: *See—*
Buirley, William L.; Koopman, Donald E.; McQuain, David B.; and Reeves, William H., 4,433,637, Cl. 116-207.000.

Verdet, Pierre: *See—*
Melan, Giuseppe; Verdet, Pierre; and Besenval, Christian, 4,433,991, Cl. 65-1.000.

Verdol S.A.: *See—*
Decuq, Guy, 4,433,704, Cl. 139-66.00R.

Veretennikova, Nadezhda I.: *See—*
Chipens, Gunar I.; Veretennikova, Nadezhda I.; and Atare, Zeltite A., 4,434,095, Cl. 260-112.50R.

Vernon, Lonnie W.; and Jacobs, Fritz E., to Exxon Research and Engineering Co. Process for converting petroleum residuals. 4,434,045, Cl. 208-107.000.

Vianova Kunstharz, A.G.: *See—*
Dworak, Gert; and Staritzbichler, Werner, 4,434,256, Cl. 523-402.000.

Vick, Ralph L., to Bendix Corporation, The. Blocking and thermal relief valve. 4,433,615, Cl. 91-420.000.

Vickers, Stanley, to Merck & Co., Inc. α-Methyldopa-L-ascorbic acid compositions. 4,434,177, Cl. 424-280.000.

Vienna Sausage Manufacturing Company: *See—*
Van Wyk, Richard; and Eisenberg, James, 4,433,621, Cl. 101-11.000.

Vierling, Donald E. Method and apparatus for continuously supplying a load. 4,433,673, Cl. 126-435.000.

Villella, Tony R. Internal combustion engine. 4,433,655, Cl. 123-196.00R.
Viner, George C., to Westinghouse Brake and Signal Co., Ltd. Swinging plug door. 4,433,505, Cl. 49-110.000.
Vinogradov, Vladimir F. Tone arm. 4,434,483, Cl. 369-255.000.
Visscher, Saralee N. Insect control methods with abscisic acid. 4,434,180, Cl. 424-317.000.
Vitkova, Stefana D.; and Mircheva, Vera V., to Institute Po Physikochimia. Bath for the electrodeposition of bright nickel iron alloy. 4,434,030, Cl. 204-43.00T.
Vitols, Reinhards; Walkinshaw, Steven; Baker, John E.; Davies, Hywel R.; and Woodward, Adrian M., to Corah Limited. Gauge changing apparatus. 4,433,561, Cl. 66-148.000.
Vivitar Corporation: *See*—
Curran, Kenneth J., 4,433,914, Cl. 356-223.000.
Voegtlin, Charles: *See*—
Robinson, Tibor; and Voegtlin, Charles, 4,434,196, Cl. 427-389.000.
Voermans, Antonius B.: *See*—
Robertson, John M.; Breed, Dirk J.; and Voermans, Antonius B., 4,434,212, Cl. 428-693.000.
Voll, Manfred: *See*—
Kleinschmit, Peter; Voll, Manfred; and Engel, Richard, 4,434,135, Cl. 422-150.000.
von der Eltz, Hans-Ulrich; Heinisch, Peter; and Ballmann, Hans J., to Hoechst AG. Process for the semicontinuous dyeing of tubular knitted fabrics of cellulose fibers with azo developing dyestuffs. 4,433,976, Cl. 8-555.000.
von Zeppelin, Dieter. Surgical clamp for vessels. 4,433,689, Cl. 128-346.000.
Vyzkumny a vyvojovy ustav Zavodu vseobecneho strojirenstvi: *See*—
Cech, Miloslav; Kuda, Vladimir; and Vasicek, Vladimir, 4,433,705, Cl. 139-435.000.
W. Gunther GmbH: *See*—
Becker, Otto, 4,434,337, Cl. 200-220.000.
W. R. Grace & Co.: *See*—
Wszolek, Walter R.; and Lundquist, Joseph T., Jr., 4,434,215, Cl. 429-144.000.
Wada, Hidekazu: *See*—
Hamabe, Takeshi; Wada, Hidekazu; Naruse, Mikio; and Nishimori, Toshiyuki, 4,434,452, Cl. 361-304.000.
Wada, Shigeaki: *See*—
Touho, Makoto; Wada, Shigeaki; and Yamamoto, Minoru, 4,434,385, Cl. 313-161.000.
Wahl, Timothy T. Bicycle rack. 4,433,786, Cl. 211-5.000.
Waine, Martin: *See*—
Rude, Edward T.; Nisenson, Jules; and Waine, Martin, 4,433,765, Cl. 192-41.00S.
Waite, Dwaine C. Baby pig feeder. 4,433,641, Cl. 119-53.000.
Wakabayashi, Takaaki: *See*—
Tanaka, Ichiro; Arato, Hiroshi; and Wakabayashi, Takaaki, 4,434,166, Cl. 424-250.000.
Wakabayashi, Takao, to 501 Nakanishi Metals Works Co., Ltd. Apparatus for preventing runaway of carriers in power and free conveyor. 4,433,628, Cl. 104-172.00S.
Wakai, Sinzi: *See*—
Takahashi, Takao; Ohnishi, Kimimasa; and Wakai, Sinzi, 4,433,706, Cl. 139-435.000.
Waldo, Paul D.: *See*—
McCaskill, Rex A.; McInroy, John W.; and Waldo, Paul D., 4,434,475, Cl. 364-900.000.
Waldron, Clifford R.: *See*—
Fairbairn, Leroy W.; and Waldron, Clifford R., 4,433,482, Cl. 29-882.000.
Walkden, John R. B.: *See*—
Edwards, Ralston G., Jr.; Walkden, John R. B.; Carstensen, Walter H.; Murphy, Gregory E.; and Lisi, John E., 4,433,776, Cl. 198-779.000.
Walker, Charles T.: *See*—
Hanger, James E.; and Walker, Charles T., 4,433,950, Cl. 414-9.000.
Walker, Charles Tillman: *See*—
Hanger, James E.; and Walker, Charles T., 4,433,950, Cl. 414-9.000.
Walkinshaw, Steven: *See*—
Vitols, Reinhards; Walkinshaw, Steven; Baker, John E.; Davies, Hywel R.; and Woodward, Adrian M., 4,433,561, Cl. 66-148.000.
Wallace, Robert L., Jr.: *See*—
Busch-Vishniac, Ilene J.; Wallace, Robert L., Jr.; and West, James E., 4,434,327, Cl. 179-111.00E.
Wallach, Steven: *See*—
Holland, Charles J.; Wallach, Steven; and Alsing, Carl J., 4,434,459, Cl. 364-200.000.
Wallmark, Erik I.: *See*—
Drakenborn, Karl-Gunnar; Enser, Mats A.; Grebner, Kurt G. E.; and Wallmark, Erik I., 4,434,460, Cl. 364-200.000.
Wallpapers Galore, Inc.: *See*—
Boender, Carl H.; and Zigterman, Roger M., 4,433,883, Cl. 312-234.100.
Walter, Lothar; Brandenstein, Manfred; Ernst, Horst M.; and Olschewski, Armin, to SKF Kugellagerfabriken GmbH. Torque transmitting bearing and method of assembly. 4,433,875, Cl. 308-6.00R.
Walter, Lothar: *See*—
Olschewski, Armin; Brandenstein, Manfred; Walter, Lothar; and Kunkel, Heinrich, 4,433,768, Cl. 192-98.000.
Walters, Paul W.: *See*—
Busch, Lloyd E.; Walters, Paul W.; and Zandona, Oliver J., 4,434,044, Cl. 208-91.000.
Walther & Cie. Aktiengesellschaft: *See*—
Gunter, Franz-Josef, 4,433,752, Cl. 182-82.000.
Warner-Lambert Company: *See*—
McGary, Charles W., Jr.; Pascarella, Vincent J.; Taller, Robert A.; Rhodes, Delmer R.; Anglin, Paul E.; and Daugherty, Charles W., 4,434,126, Cl. 264-303.000.
Poschel, Bruno P. H.; and Butler, Donald E., 4,434,169, Cl. 424-263.000.
Warner, Lucien: *See*—
Mathews, Lester R., 4,433,863, Cl. 294-19.00R.
Warwick, Edward H.; and Parker, Donald L., to General Motors Corporation. Disc brake lining retainer and wear warning arrangement. 4,433,757, Cl. 188-1.110.
Watanabe, Morio; and Nishimura, Sanji, to Solex Research Corporation of Japan. Process for production of high-purity metallic iron. 4,434,002, Cl. 75-0.5AA.
Watanabe, Tadaaki; and Tanaka, Yoshio, to Clarion Co., Ltd. Clutch mechanism. 4,433,588, Cl. 74-10.330.
Watanabe, Yoshihiro, to Tokyo Shibaura Denki Kabushiki Kaisha. Automatic bank note transaction apparatus. 4,434,359, Cl. 235-379.000.
Watase, Masami: *See*—
Kamada, Osao; Matsuga, Yoshiaki; Watase, Masami; Kudo, Tadato; Harada, Hiroyoshi; and Kanezaki, Atsushi, 4,434,022, Cl. 156-274.600.
Water Circulation Patents: *See*—
Mathews, Lester R., 4,433,863, Cl. 294-19.00R.
Waterworth, Geoffrey: *See*—
Perry, William H.; Stewart, David C.; and Waterworth, Geoffrey, 4,433,867, Cl. 296-146.000.
Watkins, William D.: *See*—
Watkins, William H.; and Watkins, William D., 4,433,749, Cl. 181-151.000.
Watkins, William H.; and Watkins, William D. Acoustic rear radiation absorption for loudspeaker systems. 4,433,749, Cl. 181-151.000.
Watson, Marshall. Work supporting apparatus. 4,433,753, Cl. 182-151.000.
Watts, Lewis W., Jr.: *See*—
Larkin, John M.; Watts, Lewis W., Jr.; and Marquis, Edward T., 4,434,308, Cl. 585-10.000.
Weatherford/Lamb, Inc.: *See*—
True, Martin E., 4,433,448, Cl. 15-88.000.
Webb, John L.: *See*—
Marsh, Dana G.; Shuey, David R.; and Webb, John L., 4,434,353, Cl. 219-216.000.
Weber, Erhard: *See*—
Heinemann, Ulrich; Thomas, Rudolf; Lantzsch, Reinhard; Ditgens, Klaus; and Weber, Erhard, 4,434,292, Cl. 548-373.000.
Weber, Giuseppe: *See*—
Cohen, Noal; and Weber, Giuseppe, 4,434,101, Cl. 260-410.90R.
Weber, Guenter, to Linde Aktiengesellschaft. Carbonate ion control to prevent losses of vanadium in oxidation of hydrogen sulfide. 4,434,143, Cl. 423-226.000.
Weber, Guenter, to Linde Aktiengesellschaft. Simultaneous scrubbing and oxidation of hydrogen sulfide using excess vanadate. 4,434,145, Cl. 423-226.000.
Weber, Guenter, to Linde Aktiengesellschaft. Scrubbing of hydrogen sulphide using pH control to control thiosulfate formation. 4,434,146, Cl. 423-226.000.
Weech, Marx E.: *See*—
Fox, Daniel W.; Miller, George P.; and Weech, Marx E., 4,434,074, Cl. 252-628.000.
Wegener, Mary J.; and Feinleib, Morris, to Benson, Inc. Method of forming infrared-sensitive photoconductors of cadmium salt crystallites. 4,434,222, Cl. 430-135.000.
Wehrly, John A.: *See*—
Coleman, Patrick L.; and Wehrly, John A., 4,434,096, Cl. 260-112.50R.
Weinberg, Roger A., to Baker Oil Tools, Inc. Conduit sealing system. 4,433,847, Cl. 277-125.000.
Welch, M. Bruce: *See*—
McDaniel, Max P.; and Welch, M. Bruce, 4,434,280, Cl. 526-106.000.
Welch, Willard M., Jr., to Pfizer Inc. Bis-esters of 4,5-di(hydroxymethyl)-2-oxo-1,3-dioxole as antibacterial agents. 4,434,173, Cl. 424-271.000.
Welland, David R., to dbx, Inc. Compensation for VCA OP amp errors. 4,434,380, Cl. 307-491.000.
Wells, Ivan D.; Koh, Jin L.; and Holmes, Marvin, to United States of America, National Aeronautics and Space Administration. Wind and solar powered turbine. 4,433,544, Cl. 60-641.120.
Wendling, Francoise: *See*—
Bisagni, Emile; Ducrocq, Claire; Rivalle, Christian; Tambourin, Pierre; Wendling, Francoise; Civier, Alain; Montagnier, Luc; Chermann, Jean-Claude; Gruest, Jacqueline; and Lidereau, Rosette, 4,434,290, Cl. 546-70.000.
Werth, Dee A.: *See*—
Ratchford, Lloyd G.; Werth, Dee A.; Luca, Vincent A., Jr.; and Schildkraut, Alan L., 4,433,889, Cl. 339-94.00M.
West, James E.: *See*—
Busch-Vishniac, Ilene J.; Wallace, Robert L., Jr.; and West, James E., 4,434,327, Cl. 179-111.00E.
Western Electric Co., Inc.: *See*—
Eckert, Robert J.; and Keene, Frederick R., Jr., 4,434,012, Cl. 134-25.400.
Spainhour, Carroll D., 4,433,970, Cl. 431-8.000.

Westinghouse Brake and Signal Co., Ltd.: *See*—
Viner, George C., 4,433,505, Cl. 49-110.000.

Westinghouse Electric Corp.: *See*—
Apfelbeck, Otto L.; and Urish, Joseph M., 4,434,358, Cl. 219-501.000.
Bell, Clifford J.; and Girgis, Ramsis S., 4,434,448, Cl. 361-23.000.
Campbell, Ira J., 4,433,830, Cl. 254-264.000.
Caputo, William R.; and Husson, Alan L., 4,433,756, Cl. 187-29.00R.
Cook, Bruce M., 4,434,132, Cl. 376-259.000.
Deis, Daniel W.; McNab, Ian R.; and Smith, Joseph L., Jr., 4,433,608, Cl. 89-8.000.
Down, Michael G.; Phillips, D. Colin; and Emmerich, Werner S., 4,434,133, Cl. 376-323.000.
Elms, Robert T., 4,434,390, Cl. 318-473.000.
Goldstein, Norman P.; and Todt, William H., 4,434,370, Cl. 250-370.000.
Healey, Daniel J., III; and Morrison, Steven, 4,434,407, Cl. 331-4.000.
Kellogg, Walter J.; Scott, Arden L.; and Seneadza, Samuel K., 4,434,394, Cl. 318-771.000.
Kemeny, George A., 4,433,607, Cl. 89-8.000.
Schenone, Carl E.; and Rosinski, Joseph, 4,433,978, Cl. 48-76.000.
Spiegelman, Stanley R.; Salton, Robert B.; Beer, Robert W.; Malandra, Louis J.; and Cognevich, Michael L., 4,433,828, Cl. 254-29.00A.
Tragesser, Charles W., 4,434,334, Cl. 200-148.00R.
Williams, W. Wayne, 4,433,848, Cl. 277-199.000.

Wetmore, Judson D.: *See*—
Blaas, Wolfgang; Bergl, Friedrich; and Wetmore, Judson D., 4,434,020, Cl. 156-216.000.

Whatton, Rodney; and Gilder, Timothy W. Method for forming wood fibres. 4,433,813, Cl. 241-21.000.

Whealton, John H.: *See*—
Dagenhart, William K.; Haselton, Halsey H.; Stirling, William L.; and Whealton, John H., 4,434,131, Cl. 376-130.000.

Wheeler, William R., to Tencor Instruments. Wafer chuck with wafer cleaning feature. 4,433,835, Cl. 269-14.000.

Whiteman, Aharon: *See*—
Shoher, Itzhak; and Whiteman, Aharon, 4,434,211, Cl. 428-552.000.

Widmer, Jakob: *See*—
Halder, Mathis; Widmer, Jakob; and De Vries, Jacob, 4,434,400, Cl. 324-110.000.

Wikel, James H., II, to Eli Lilly and Company. Preparation of substituted 1-thiazinyl or 1-thiazolyl-2-aminobenzimidazoles. 4,434,288, Cl. 544-54.000.

Wilcockson, Brian: *See*—
DeGraw, Kenneth J.; Wilcockson, Brian; Nickerson, Earl W.; Bocchini, William R.; Bogossian, Armen; and Proios, Steve, 4,433,443, Cl. 4-317.000.

Wilgus, Herbert S.; and Haefner, John A., to Eastman Kodak Company. High aspect ratio silver bromoiodide emulsions and processes for their preparation. 4,434,226, Cl. 430-567.000.

Wilkens, Walter F.: *See*—
Chandler, William S.; Wilkens, Walter F.; and Heiss, John F., 4,434,187, Cl. 426-652.000.

Wilkinson, Randolph N., III; Sneed, Elmore C.; and Mueller, Janet M., to Proctor & Gamble Company, The. Tapered-bottom bleach cake for sanitation dosing dispenser. 4,434,136, Cl. 422-263.000.

Williams, Anthony P.; and Carter, Ralph G., to Brandhurst Company Limited. Flowmeter. 4,433,574, Cl. 73-200.000.

Williams, Dylan F.: *See*—
Cho, Frederick Y.; and Williams, Dylan F., 4,434,383, Cl. 310-313.00R.

Williams, W. Wayne, to Westinghouse Electric Corp. Large annular segmented seal with lock portions for missile launch tube. 4,433,848, Cl. 277-199.000.

Williamson, Joanne M.: *See*—
Meister, Altos; and Williamson, Joanne M., 4,434,158, Cl. 424-94.000.

Williamson, Steven L.: *See*—
Mourou, Gerard; Valdmanis, Janis A.; and Williamson, Steven L., 4,434,399, Cl. 324-96.000.

Willis, Carl L.: *See*—
Slaugh, Lynn H.; and Willis, Carl L., 4,433,981, Cl. 55-59.000.

Wilson, Glenn E. Lock decoder. 4,433,563, Cl. 70-446.000.

Wilson, Joe C.: *See*—
Davis, Pauls; and Wilson, Joe C., 4,434,065, Cl. 252-75.000.

Wilwerding, Dennis J., to Honeywell Inc. Displacement dependent low contrast default. 4,434,362, Cl. 250-201.000.

Windmoller & Holscher: *See*—
Mundus, Friedhelm; and Achelpohl, Fritz, 4,433,599, Cl. 83-87.000.

Winger, James L., to General Motors Corporation. Printed circuit edgeboard connector with multi-function lock. 4,433,888, Cl. 339-91.00R.

Winter, Roger D.; Workman, David E.; and Nordstrom, Mark B., to Samsonite Corporation. Portfolio with frame and integral article retainers. 4,433,761, Cl. 190-109.000.

Winterbotham, Peter: *See*—
Billington, Reginald; Edge, David J.; and Winterbotham, Peter, 4,434,088, Cl. 252-547.000.
Billington, Reginald; Edge, David J.; and Winterbotham, Peter, 4,434,089, Cl. 252-547.000.

Witco Chemical Corporation: *See*—
Spiegelman, Gerald; and Liauw, Koei-Liang, 4,434,102, Cl. 260-429.700.

Withers, James C.; and Loutfy, Raouf O., to Atlantic Richfield Company. Acid melt treatment to activate carbon for use as reductant. 4,434,149, Cl. 423-496.000.

Witten, Franklyn H.; and Kline, Sherman S., to Datapoint Corporation. Connecting mechanism for word processor - controlled printer output module cabinets. 4,433,881, Cl. 312-107.500.

Wittman, Ortwin: *See*—
Muller, Hans-Jurgen; Schmidt, Karl; Chattopadhayay, Asoke; Heidemanns, Rolf P.; Habel, Georg; and Wittman, Ortwin, 4,433,662, Cl. 123-438.000.

Witzig, John W. Orthopedic corrector and method of correction of Class II malocclusion. 4,433,956, Cl. 433-7.000.

Woebcke, Herman N.: *See*—
Gartside, Robert J.; and Woebcke, Herman N., 4,433,984, Cl. 55-196.000.

Wohl, Ronald A.: *See*—
Diamond, Julius; and Wohl, Ronald A., 4,434,174, Cl. 424-273.00B.

Wolff, Robin K.: *See*—
Hill, Ira D.; Trenkle, Robert W.; Mookherjee, Braja D.; and Wolff, Robin K., 4,434,086, Cl. 252-522.00R.

Woodward, Adrian M.: *See*—
Vitols, Reinhards; Walkinshaw, Steven; Baker, John E.; Davies, Hywel R.; and Woodward, Adrian M., 4,433,561, Cl. 66-148.000.

Woodward, Robert B.; and Bickel, Hans, to Ciba-Geigy Corporation. Cephalosporin derivatives. 4,434,287, Cl. 544-16.000.

Woolf, Robert M. Combination back pack and bicycle saddle pack. 4,433,802, Cl. 224-153.000.

Wooley, Alan H.; and Masten, Billy R., to Texas Instruments Incorporated. Optical sensing device for reading bar code or the like. 4,434,360, Cl. 235-472.000.

Workman, David E.: *See*—
Winter, Roger D.; Workman, David E.; and Nordstrom, Mark B., 4,433,761, Cl. 190-109.000.

Wszolek, Walter R.; and Lundquist, Joseph T., Jr., to W. R. Grace & Co. Battery separator. 4,434,215, Cl. 429-144.000.

Wyant, Robert E.: *See*—
Baldwin, Maynard M.; and Wyant, Robert E., 4,434,032, Cl. 204-72.000.

Wyke, Paul R. Snow ski. 4,433,855, Cl. 280-609.000.

Xerox Corporation: *See*—
Bol, Izya, 4,434,013, Cl. 148-1.500.
Marsh, Dana G.; Shuey, David R.; and Webb, John L., 4,434,353, Cl. 219-216.000.

Yabsley, Michael A.: *See*—
Smith, Lindsay K.; and Yabsley, Michael A., 4,434,017, Cl. 149-2.000.

Yamada, Keiichiro: *See*—
Nakakita, Kiyomi; and Yamada, Keiichiro, 4,433,651, Cl. 123-188.00M.

Yamada, Shigeki: *See*—
Chibata, Ichiro; Yamada, Shigeki; Hongo, Chikara; and Yoshioka, Ryuzo, 4,434,107, Cl. 260-501.120.

Yamada, Tamotsu: *See*—
Izutsu, Tadashi; Koutake, Masanobu; Hiraoka, Yasunobu; Takafuji, Shin-ichi; Yamada, Tamotsu; Kurosawa, Seiji; and Satoh, Tetsuo, 4,433,618, Cl. 99-455.000.

Yamaguchi, Hisao: *See*—
Sekine, Kunio; Suzuki, Yoshiki; Yamashita, Gentaro; and Yamaguchi, Hisao, 4,434,159, Cl. 424-178.000.

Yamaguchi, Yukiharu: *See*—
Kawasaki, Takao; Osaka, Yoshiaki; Komatsu, Katsumi; Yamaguchi, Yukiharu; and Ono, Saichi, 4,434,172, Cl. 424-270.000.

Yamaha Hatsudoki Kabushiki Kaisha: *See*—
Yoshida, Keisuke, 4,433,856, Cl. 280-668.000.

Yamamoto, Minoru: *See*—
Touho, Makoto; Wada, Shigeaki; and Yamamoto, Minoru, 4,434,385, Cl. 313-161.000.

Yamanoi, Hiroshi: *See*—
Uedaira, Satoru; Shimizu, Hidetoshi; Tamura, Hidemasa; Taguchi, Hiromichi; Yamanoi, Hiroshi; and Makino, Yoshimi, 4,434,202, Cl. 428-143.000.

Yamashita, Gentaro: *See*—
Sekine, Kunio; Suzuki, Yoshiki; Yamashita, Gentaro; and Yamaguchi, Hisao, 4,434,159, Cl. 424-178.000.

Yanabu, Satoru; and Tamagawa, Tohoru, to Tokyo Shibaura Denki Kabushiki Kaisha. Hybrid-type interrupting apparatus. 4,434,332, Cl. 200-144.0AP.

Yanagisawa, Hifumi: *See*—
Sakuma, Shinzo; Yanagisawa, Hifumi; Tokuhata, Kazuo; and Miyagawa, Hiroshi, 4,434,331, Cl. 200-144.00B.

Yarnitsky, Yashaya; and Kaldor, Shmuel, to RCA Corporation. Jig for machining stylus blanks. 4,433,794, Cl. 221-224.000.

Yasuda, Makoto: *See*—
Kurosaka, Nobuo; Yasuda, Makoto; and Murakami, Tadateru, 4,434,305, Cl. 568-768.000.

Yasuda, Takeru: *See*—
Teramura, Mitsuyoshi; Takimoto, Masatami; Nakamura, Norihiko; Itou, Takaaki; Katou, Takashi; Yasuda, Takeru; and Kitamura, Sunao, 4,434,111, Cl. 261-44.00C.

Yasuhara, Seishi: *See*—
Masaki, Kenji; and Yasuhara, Seishi, 4,433,666, Cl. 123-569.000.

Yazaki Corporation: *See*—
Suzuki, Yoshitsugu; Iizuka, Syogo; Kajiyama, Shigeo; Usui, Kenji; and Kobayashi, Masahiro, 4,433,479, Cl. 29-825.000.

Yazawa, Hirosi: *See*—
Okada, Tokio; Kojima, Shigezo; Tani, Haruhisa; Kurihara, Kazuhiko; and Yazawa, Hirosi, 4,434,128, Cl. 264-560.000.

Yerushalmi, Yaakov, to Koor Metals Ltd. Blast and fragment-resistant protective wall structure. 4,433,522, Cl. 52-426.000.

Yllo, Walter: *See*—
Brugel, Edward G.; and Yllo, Walter, 4,434,261, Cl. 524-109.000.
Schumacher, Frederick G.; and Yllo, Walter, 4,434,258, Cl. 524-13.000.

Yokoi, Fumiaki, to Yoshida Kogyo K. K. Method of manufacturing a row of continuous coupling elements for slide fasteners. 4,433,537, Cl. 57-264.000.

Yokooku, Katsuhiko, to Toyo Kogyo Co., Ltd. Knock control device for internal combustion engine. 4,433,654, Cl. 123-425.000.

Yokota, Masazi; and Noguchi, Masaru, to Fuji Photo Film Co., Ltd. Process for producing holograms. 4,433,893, Cl. 350-3.610.

Yonezawa, Akira, to International Precision Incorporated. Electron microscope. 4,434,367, Cl. 250-311.000.

Yoon, Hee K., to Johnson & Johnson Products, Inc. Polyurethane casting material. 4,433,680, Cl. 128-90.000.

Yorifuji, Yuki; Uyama, Seiichi; Fukutake, Katsuhiko; and Miyazaki, Masaharu, to Matsushita Electric Works, Ltd. Photoelectric switching apparatus. 4,434,363, Cl. 250-214.00B.

York, Robert A., to Flight Systems, Inc. Apparatus for testing semiconductor devices and capacitors. 4,434,401, Cl. 324-158.0SC.

Yoshida, Keisuke, to Yamaha Hatsudoki Kabushiki Kaisha. Spring seat for snowmobile strut. 4,433,856, Cl. 280-668.000.

Yoshida, Kobun, to Pioneer Electronic Corporation. Tape recorder. 4,434,443, Cl. 360-74.400.

Yoshida Kogyo K. K.: *See*—
Oyama, Yoshio, 4,433,478, Cl. 29-767.000.
Yokoi, Fumiaki, 4,433,537, Cl. 57-264.000.

Yoshii, Yuuji: *See*—
Narisawa, Shizuo; Taira, Yoshito; Yoshii, Yuuji; and Kondou, Tomizou, 4,434,257, Cl. 524-5.000.

Yoshikawa, Akira; Takeda, Akitsu; Ochi, Osamu; Hisaki, Tomoko; and Mizushima, Yoshihiko, to Nippon Telegraph & Telephone Public Corp. Method of pattern formation. 4,434,224, Cl. 430-323.000.

Yoshino, Koichiro: *See*—
Tsukamoto, Goro; Kohno, Toshihiko; Yoshino, Koichiro; Morita, Tominori; Ito, Keizo; and Nose, Takashi, 4,434,162, Cl. 424-200.000.

Yoshioka, Ryuzo: *See*—
Chibata, Ichiro; Yamada, Shigeki; Hongo, Chikara; and Yoshioka, Ryuzo, 4,434,107, Cl. 260-501.120.

Young, Lawrence C.: *See*—
Pontes, Virgil M.; and Young, Lawrence C., 4,433,814, Cl. 242-72.100.

Youngfleish, Frank C.: *See*—
Cassarly, James W.; Rollings, Robert W.; and Youngfleish, Frank C., 4,433,886, Cl. 339-14.00R.

Zadiraka, Allan J., to Babcock & Wilcox Company, The. Boiler water trip system. 4,433,646, Cl. 122-504.200.

Zaidan Hojin Handotai Kenkyu Shinkokai: *See*—
Nishizawa, Jun-ichi, 4,434,433, Cl. 357-22.000.

Zandona, Oliver J.: *See*—
Busch, Lloyd E.; Walters, Paul W.; and Zandona, Oliver J., 4,434,044, Cl. 208-91.000.

Zaplatynsky, Isidor, to United States of America, National Aeronautics and Space Administration. Method and apparatus for coating substrates using a laser. 4,434,189, Cl. 427-53.100.

Zappia, Anthony T. Air fuel engine. 4,433,549, Cl. 60-712.000.

Zauer, Karoly: *See*—
Lempert, Karoly; Harsanyi, Kalman; Doleschall, Gabor; Hornyak, Gyula; Nyitrai, Jozsef; Zauer, Karoly; Fetter, Jozsef; Simig, Gyula; Gombos nee Visky, Zsuzsanna; and Szalai nee Barta, Gizella, 4,434,099, Cl. 260-239.00A.

Ziemann, Heinz: *See*—
Findeisen, Kurt; and Ziemann, Heinz, 4,434,289, Cl. 546-14.000.

Zigterman, Roger M.: *See*—
Boender, Carl H.; and Zigterman, Roger M., 4,433,883, Cl. 312-234.100.

Zimmerlin, Sharon L.: *See*—
Bohl, Thomas L.; Pocock, Robert E.; and Zimmerlin, Sharon L., 4,433,922, Cl. 374-36.000.

Zolton, Raymond P.; Kaplan, Paul M.; and Padvelskis, John V., to Ortho Diagnostic Systems Inc. Methods for preparation of HB_2Ag free gamma globulins. 4,434,093, Cl. 260-112.00B.

Zwalve, Albert. Vehicle with individually suspended wheels. 4,433,857, Cl. 280-690.000.

501 Nakanishi Metals Works Co., Ltd.: *See*—
Wakabayashi, Takao, 4,433,628, Cl. 104-172.00S.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 28TH DAY OF FEBRUARY, 1984

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Boyd, John H., Jr.; and Nelson, Don C., Jr., to General Electric Company. Adaptable resilient motor mounting. Re. 31,525, Cl. 248-581.000.

General Electric Company: *See*—
Boyd, John H., Jr.; and Nelson, Don C., Jr., Re. 31,525, Cl. 248-581.000.

Lindstrom, Jan N.: *See*—
Smith, Ulf K. H.; Lindstrom, Jan N.; and Mantle, Harold, Re. 31,526, Cl. 75-235.000.

Mantle, Harold: *See*—
Smith, Ulf K. H.; Lindstrom, Jan N.; and Mantle, Harold, Re. 31,526, Cl. 75-235.000.

Nelson, Don C., Jr.: *See*—
Boyd, John H., Jr.; and Nelson, Don C., Jr., Re. 31,525, Cl. 248-581.000.

Santrade Ltd.: *See*—
Smith, Ulf K. H.; Lindstrom, Jan N.; and Mantle, Harold, Re. 31,526, Cl. 75-235.000.

Smith, Ulf K. H.; Lindstrom, Jan N.; and Mantle, Harold, to Santrade Ltd. Coated cemented carbide body and method of making such a body. Re. 31,526, Cl. 75-235.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Camco, Incorporated: *See*—
Pringle, Ronald E., B1 4,161,219, Cl. 166-324.000.

Harris Research Inc.: *See*—
Harris, Robert D., B1 4,219,333, Cl. 8-137.000.

Harris, Robert D., to Harris Research Inc. Carbonated cleaning solution. B1 4,219,333, 2-28-84, Cl. 8-137.000.

Pringle, Ronald E., to Camco, Incorporated. Piston actuated well safety valve. B1 4,161,219, 2-28-84, Cl. 166-324.000.

LIST OF DESIGN PATENTEES

AAA Associates, Inc.: *See*—
McVicker, Robert J.; and Mann, Wilford R., 272,846, Cl. D23-139.000.

AMP Incorporated: *See*—
Cosmos, Pete; and McCleerey, Earl W., 272,820, Cl. D13-24.000.

Anthos S.A.: *See*—
Bulgari, Giovanni, 272,859, Cl. D27-42.000.

Appel, Mel; and Kress, George, to Appel, Mel. Mug. 272,793, 2-28-84, Cl. D7-5.000.

Appel, Mel; and Kress, George, to Appel, Mel. Ride-on toy. 272,837, 2-28-84, Cl. D21-71.000.

Appel, Mel; and Kress, George, to Appel, Mel. Doll. 272,843, 2-28-84, Cl. D21-171.000.

Atari, Inc.: *See*—
Lichac, Gerald J., 272,835, Cl. D21-48.000.

B. F. Goodrich Company, The: *See*—
Birkel, Carl D.; and Wright, David A., 272,816, Cl. D12-147.000.

Babcock & Wilcox Company, The: *See*—
Bean, Thomas R.; Stockmaster, Edward F.; and Whaley, George S., 272,819, Cl. D13-12.000.

Balaban, David B.: *See*—
Bienwald, Wolfgang F.; and Balaban, David B., 272,822, Cl. D13-32.000.

Baxter Travenol Laboratories, Inc.: *See*—
Kulle, Lee K., 272,850, Cl. D24-24.000.

Bayerische Motoren Werke Aktiengesellschaft: *See*—
Luthe, Claus; Rennen, Manfred; and Braun, Hans, 272,808, Cl. D10-111.000.

Bean, Thomas R.; Stockmaster, Edward F.; and Whaley, George S., to Babcock & Wilcox Company, The. Control system module for mounting in a control panel. 272,819, 2-28-84, Cl. D13-12.000.

Becton Dickinson and Company: *See*—
Percarpio, Edward P., 272,856, Cl. D24-99.000.

Bel, Roger P.; and Hascoet, Martial E., to Metallisations et Traitements Optiques M.T.O. Endoscope and an accompanying eyepiece. 272,849, 2-28-84, Cl. D24-18.000.

Bel, Roger P.; Hascoet, Martial E.; and Regnier, Michel M., to Metallisations et Traitements Optiques M.T.O. Biopsy forceps. 272,855, 2-28-84, Cl. D24-28.000.

Bell Helmets Inc.: *See*—
Sundahl, James G.; and Broersma, Lester V., 272,769, Cl. D2-231.000.

Bent, Bruce C.: *See*—
Bent, James A.; and Bent, Bruce C., 272,809, Cl. D10-109.000.

Bent, James A.; and Bent, Bruce C. Traffic control marker. 272,809, 2-28-84, Cl. D10-109.000.

Berkley and Company, Inc.: *See*—
Rumbaugh, James T., 272,785, Cl. D6-114.000.
Rumbaugh, James T., 272,787, Cl. D6-125.000.

Bienwald, Wolfgang F.; and Balaban, David B., to Leviton Manufacturing Company, Inc. Switch. 272,822, 2-28-84, Cl. D13-32.000.

Birgy, Claude: *See*—
van Assche, Daniel; Birgy, Claude; Kessler, Armin; and Gmelin, Gernot, 272,833, Cl. D19-62.000.

Birkel, Carl D.; and Wright, David A., to B. F. Goodrich Company, The. Tire. 272,816, 2-28-84, Cl. D12-147.000.

Braun, Hans: *See*—
Luthe, Claus; Rennen, Manfred; and Braun, Hans, 272,808, Cl. D10-111.000.

Braun, Morris, to W. Braun Company. Jar, or similar article. 272,804, 2-28-84, Cl. D9-353.000.

Brobakken, Jeanette D. Simulative picture frame. 272,791, 2-28-84, Cl. D6-234.000.

Broersma, Lester V.: *See*—
Sundahl, James G.; and Broersma, Lester V., 272,769, Cl. D2-231.000.
Sundahl, James G.; and Broersma, Lester V., 272,770, Cl. D2-232.000.

Brother Kogyo Kabushiki Kaisha: *See*—
Iseki, Mitsuru, 272,831, Cl. D18-1.000.

Buechel, Frederick F.; Pappas, Michael J.; and Witte, Paul A. Tibial resection guide. 272,853, 2-28-84, Cl. D24-26.000.

Buechel, Frederick F.: *See*—
Witte, Paul A.; Buechel, Frederick F.; and Pappas, Michael J., 272,854, Cl. D24-26.000.

Bulgari, Giovanni, to Anthos S.A. Lighter. 272,859, 2-28-84, Cl. D27-42.000.

Bulgari, Marina, to Zoldia Anstalt. Ring. 272,811, 2-28-84, Cl. D11-34.000.

Burghard, Bero; and Schauer, Helmut. Engine washing and cleaning apparatus. 272,862, 2-28-84, Cl. D32-4.000.
Buscom Systems, Inc.: *See*—
Fukunaga, Kenichi, 272,823, Cl. D14-66.000.
California Cooperage: *See*—
Perethian, Charles M., 272,821, Cl. D13-12.000.
Chase, David O.: *See*—
Handy, Binns; and Chase, David O., 272,806, Cl. D9-416.000.
Churley, George. Support stand for works of art. 272,788, 2-28-84, Cl. D6-176.000.
Clark Equipment Company: *See*—
Sapelak, Ronald, 272,827, Cl. D15-28.000.
Cochran, Gary L.; Stromberg, Gary D.; Dawson, James E.; Lanphere, Ralph C.; and Klee, Maurice, to J. I. Case Company. Skid steer loader. 272,825, 2-28-84, Cl. D15-25.000.
Cochran, Gary L.; Stromberg, Gary D.; Dawson, James E.; Lanphere, Ralph C.; and Klee, Maurice, to J. I. Case Company. Skid steer loader. 272,826, 2-28-84, Cl. D15-25.000.
Cosmos, Pete; and McCleerey, Earl W., to AMP Incorporated. 90° Cable strain relief and electrical connector cover. 272,820, 2-28-84, Cl. D13-24.000.
CPG Products Corp.: *See*—
Pelavin, Joseph Y.; and Stolarz, Edward M., 272,776, Cl. D3-76.000.
Dall-Winther, Dennis P. Penlight holder. 272,802, 2-28-84, Cl. D8-396.000.
Darling, Dwight L. Bicycle noise maker. 272,814, 2-28-84, Cl. D12-114.000.
Dart Container Corporation: *See*—
Dart, Kenneth B., 272,794, Cl. D7-6.000.
Dart Industries Inc.: *See*—
Wolff, Martin J., 272,796, Cl. D7-99.000.
Dart, Kenneth B., to Dart Container Corporation. Beverage cup. 272,794, 2-28-84, Cl. D7-6.000.
Dawson, James E.: *See*—
Cochran, Gary L.; Stromberg, Gary D.; Dawson, James E.; Lanphere, Ralph C.; and Klee, Maurice, 272,825, Cl. D15-25.000.
Cochran, Gary L.; Stromberg, Gary D.; Dawson, James E.; Lanphere, Ralph C.; and Klee, Maurice, 272,826, Cl. D15-25.000.
Dells, Inc.: *See*—
Johnsen, Dell E., 272,805, Cl. D9-415.000.
Dunlop Limited: *See*—
Hatakenaka, Kenji, 272,815, Cl. D12-146.000.
Epoch Company, Ltd.: *See*—
Matsumoto, Teruo, 272,840, Cl. D21-104.000.
Matsumoto, Teruo, 272,841, Cl. D21-104.000.
Matsumoto, Teruo, 272,842, Cl. D21-104.000.
F. Lli Guzzini S.p.A.: *See*—
Pozzi, Ambrogio, 272,795, Cl. D7-78.000.
Four Star Corporation: *See*—
Mareydt, Ray G., 272,817, Cl. D12-155.000.
Fukunaga, Kenichi, to Buscom Systems, Inc. Tone generator mouthpiece console. 272,823, 2-28-84, Cl. D14-66.000.
Gelles, Daniel E. Garment display rack. 272,783, 2-28-84, Cl. D6-85.000.
Giroflex Entwicklungs AG: *See*—
Ochsner, Koni, 272,781, Cl. D6-75.000.
Gmelin, Gernot: *See*—
van Assche, Daniel; Birgy, Claude; Kessler, Armin; and Gmelin, Gernot, 272,833, Cl. D19-62.000.
Government Innovators, Inc.: *See*—
Pickrell, John W., 272,813, Cl. D12-15.000.
Green, David T.; Rawson, Paul O.; and Yagami, Richard, to United States Surgical Corporation. Linear anastomosis stapler. 272,851, 2-28-84, Cl. D24-26.000.
Green, David T.; Rawson, Paul O.; and Yagami, Richard, to United States Surgical Corporation. Linear anastomosis stapler. 272,852, 2-28-84, Cl. D24-26.000.
Handy, Binns; and Chase, David O., to Lenox Incorporated. Packaging container. 272,806, 2-28-84, Cl. D9-416.000.
Hara, Kunio; and Yasutani, Shigeki, to Tokyo Shibaura Denki Kabushiki Kaisha. Original feeder for copying machine. 272,830, 2-28-84, Cl. D16-32.000.
Hascoet, Martial E.: *See*—
Bel, Roger P.; and Hascoet, Martial E., 272,849, Cl. D24-18.000.
Bel, Roger P.; Hascoet, Martial E.; and Regnier, Michel M., 272,855, Cl. D24-28.000.
Hatakenaka, Kenji, to Dunlop Limited. Tire for a vehicle wheel. 272,815, 2-28-84, Cl. D12-146.000.
Incando, Peter A. Clip for securing hairpiece to natural hair. 272,861, 2-28-84, Cl. D28-93.000.
Irish, Sally G. Rug. 272,790, 2-28-84, Cl. D6-210.000.
Iseki, Mitsuru, to Brother Kogyo Kabushiki Kaisha. Typewriter. 272,831, 2-28-84, Cl. D18-1.000.
J. I. Case Company: *See*—
Cochran, Gary L.; Stromberg, Gary D.; Dawson, James E.; Lanphere, Ralph C.; and Klee, Maurice, 272,825, Cl. D15-25.000.
Cochran, Gary L.; Stromberg, Gary D.; Dawson, James E.; Lanphere, Ralph C.; and Klee, Maurice, 272,826, Cl. D15-25.000.
Jennings, Joseph R.; and Minor, Michael, to Paramount Pictures Corporation. Toy spaceship. 272,839, 2-28-84, Cl. D21-87.000.
Johnsen, Dell E., to Dells, Inc. Container for a pizza kit. 272,805, 2-28-84, Cl. D9-415.000.
Kato, Takaharu, to Ricoh Company, Ltd. Camera. 272,829, 2-28-84, Cl. D16-8.000.
Kelling, Gordon L., to Phillips Temro, Inc. Diesel fuel warmer. 272,844, 2-28-84, Cl. D23-77.000.
Kessler, Armin: *See*—
van Assche, Daniel; Birgy, Claude; Kessler, Armin; and Gmelin, Gernot, 272,833, Cl. D19-62.000.
Keystone Consolidated Industries, Inc.: *See*—
Pawlow, Valentin, 272,800, Cl. D8-318.000.
Klee, Maurice: *See*—
Cochran, Gary L.; Stromberg, Gary D.; Dawson, James E.; Lanphere, Ralph C.; and Klee, Maurice, 272,825, Cl. D15-25.000.
Cochran, Gary L.; Stromberg, Gary D.; Dawson, James E.; Lanphere, Ralph C.; and Klee, Maurice, 272,826, Cl. D15-25.000.
Kodaka, Tatsuya. Mosquito figure. 272,812, 2-28-84, Cl. D11-162.000.
Kohno, Noboru, to Mizuno Corporation. Cleated shoe sole. 272,772, 2-28-84, Cl. D2-320.000.
Koper, James G.: *See*—
Kumar, Shri A.; Ljung, Bo; and Koper, James G., 272,801, Cl. D8-325.000.
Koziol, Walter, to Modern Home Products Corp. Ceramic briquette for a cooking grill. 272,847, 2-28-84, Cl. D23-166.000.
Koziol, Walter, to Modern Home Products Corp. Ceramic briquette for a cooking grill. 272,848, 2-28-84, Cl. D23-166.000.
Kress, George: *See*—
Appel, Mel; and Kress, George, 272,793, Cl. D7-5.000.
Appel, Mel; and Kress, George, 272,837, Cl. D21-71.000.
Appel, Mel; and Kress, George, 272,843, Cl. D21-171.000.
Kulle, Lee K., to Baxter Travenol Laboratories, Inc. Drip chamber spike. 272,850, 2-28-84, Cl. D24-24.000.
Kumar, Shri A.; Ljung, Bo; and Koper, James G., to Singer Company, The. Flexure hinge for gyroscopes or the like. 272,801, 2-28-84, Cl. D8-325.000.
Lanphere, Ralph C.: *See*—
Cochran, Gary L.; Stromberg, Gary D.; Dawson, James E.; Lanphere, Ralph C.; and Klee, Maurice, 272,825, Cl. D15-25.000.
Cochran, Gary L.; Stromberg, Gary D.; Dawson, James E.; Lanphere, Ralph C.; and Klee, Maurice, 272,826, Cl. D15-25.000.
Leach, Kant F. Safety clamp for ladders. 272,857, 2-28-84, Cl. D25-68.000.
Lenk, Milton E. B. Magnetic disc spinning toy. 272,836, 2-28-84, Cl. D21-59.000.
Lenox Incorporated: *See*—
Handy, Binns; and Chase, David O., 272,806, Cl. D9-416.000.
Leviton Manufacturing Company, Inc.: *See*—
Bienwald, Wolfgang F.; and Balaban, David B., 272,822, Cl. D13-32.000.
Lichac, Gerald J., to Atari, Inc. Lower housing for a control unit for a video game. 272,835, 2-28-84, Cl. D21-48.000.
Lilaud Products: *See*—
Swatzell, Lillian, 272,860, Cl. D28-20.000.
Ljung, Bo: *See*—
Kumar, Shri A.; Ljung, Bo; and Koper, James G., 272,801, Cl. D8-325.000.
Luthe, Claus; Rennen, Manfred; and Braun, Hans, to Bayerische Motoren Werke Aktiengesellschaft. Side reflector for automobile. 272,808, 2-28-84, Cl. D10-111.000.
Malamoud, Jean G., to S. T. DuPont. Fountain pen. 272,832, 2-28-84, Cl. D19-51.000.
Mann, Wilford R.: *See*—
McVicker, Robert J.; and Mann, Wilford R., 272,846, Cl. D23-139.000.
Mareydt, Ray G., to Four Star Corporation. Vehicle side rail. 272,817, 2-28-84, Cl. D12-155.000.
Marx, Robert S. Combined garment form and hanger therefor. 272,792, 2-28-84, Cl. D6-248.000.
Matcote Company, Inc.: *See*—
McMullen, Sam D., 272,863, Cl. D34-17.000.
Matsumoto, Teruo, to Epoch Company, Ltd. Puzzle. 272,840, 2-28-84, Cl. D21-104.000.
Matsumoto, Teruo, to Epoch Company, Ltd. Puzzle. 272,841, 2-28-84, Cl. D21-104.000.
Matsumoto, Teruo, to Epoch Company, Ltd. Puzzle. 272,842, 2-28-84, Cl. D21-104.000.
McCleerey, Earl W.: *See*—
Cosmos, Pete; and McCleerey, Earl W., 272,820, Cl. D13-24.000.
McCuiston, Paul R. Combined ski and pole rack. 272,786, 2-28-84, Cl. D6-125.000.
McGourty, Michael J., to Pye (Electronic Products) Limited. Radio apparatus. 272,824, 2-28-84, Cl. D14-71.000.
McMullen, Sam D., to Matcote Company, Inc. Mobile material delivery cart. 272,863, 2-28-84, Cl. D34-17.000.
McVicker, Robert J.; and Mann, Wilford R., to AAA Associates, Inc. Fan housing for grain dryers. 272,846, 2-28-84, Cl. D23-139.000.
Metallisations et Traitements Optiques M.T.O.: *See*—
Bel, Roger P.; and Hascoet, Martial E., 272,849, Cl. D24-18.000.
Bel, Roger P.; Hascoet, Martial E.; and Regnier, Michel M., 272,855, Cl. D24-28.000.
Minor, Michael: *See*—
Jennings, Joseph R.; and Minor, Michael, 272,839, Cl. D21-87.000.
Mizuno Corporation: *See*—
Kohno, Noboru, 272,772, Cl. D2-320.000.
Modern Home Products Corp.: *See*—
Koziol, Walter, 272,847, Cl. D23-166.000.
Koziol, Walter, 272,848, Cl. D23-166.000.
Moore, William H. Template organizer stand. 272,834, 2-28-84, Cl. D19-75.000.

Muller Feigelstock, Roberto, to Pony International, Inc. Low cut athletic shoe. 272,771, 2-28-84, Cl. D2-311.000.
Negoro, Hisao. Chuck. 272,828, 2-28-84, Cl. D15-140.000.
Ochsner, Koni, to Giroflex Entwicklungs AG. Chair or similar article. 272,781, 2-28-84, Cl. D6-75.000.
O'Connell, Timothy A. Toy rocking horse. 272,838, 2-28-84, Cl. D21-75.000.
Omni R & D, Inc.: *See*—
Williams, Robert E., Jr., 272,784, Cl. D6-85.000.
Pace Industries Inc.: *See*—
Palka, James J., 272,858, Cl. D26-80.000.
Palka, James J., to Pace Industries Inc. Light fixture. 272,858, 2-28-84, Cl. D26-80.000.
Pappas, Michael J.: *See*—
Buechel, Frederick F.; Pappas, Michael J.; and Witte, Paul A., 272,853, Cl. D24-26.000.
Witte, Paul A.; Buechel, Frederick F.; and Pappas, Michael J., 272,854, Cl. D24-26.000.
Paramount Pictures Corporation: *See*—
Jennings, Joseph R.; and Minor, Michael, 272,839, Cl. D21-87.000.
Pawlow, Valentin, to Keystone Consolidated Industries, Inc. Pull. 272,800, 2-28-84, Cl. D8-318.000.
Pelavin, Joseph Y.; and Stolarz, Edward M., to CPG Products Corp. Attache case. 272,776, 2-28-84, Cl. D3-76.000.
Percarpio, Edward P., to Becton Dickinson and Company. Stopper for test tubes and the like. 272,856, 2-28-84, Cl. D24-99.000.
Perethian, Charles M., to California Cooperage. Air switch. 272,821, 2-28-84, Cl. D13-12.000.
Petitt, Donald C. Chair. 272,778, 2-28-84, Cl. D6-31.000.
Phillips Temro, Inc.: *See*—
Kelling, Gordon L., 272,844, Cl. D23-77.000.
Pickrell, John W., to Government Innovators, Inc. Refuse truck body. 272,813, 2-28-84, Cl. D12-15.000.
Pluss, Paul D. Shovel blade. 272,799, 2-28-84, Cl. D8-10.000.
Pony International, Inc.: *See*—
Muller Feigelstock, Roberto, 272,771, Cl. D2-311.000.
Pozzi, Ambrogio, to F. Lli Guzzini S.p.A. Ice-bucket. 272,795, 2-28-84, Cl. D7-78.000.
Pye (Electronic Products) Limited: *See*—
McGourty, Michael J., 272,824, Cl. D14-71.000.
Rawson, Paul O.: *See*—
Green, David T.; Rawson, Paul O.; and Yagami, Richard, 272,851, Cl. D24-26.000.
Green, David T.; Rawson, Paul O.; and Yagami, Richard, 272,852, Cl. D24-26.000.
Regnier, Michel M.: *See*—
Bel, Roger P.; Hascoet, Martial E.; and Regnier, Michel M., 272,855, Cl. D24-28.000.
Rennen, Manfred: *See*—
Luthe, Claus; Rennen, Manfred; and Braun, Hans, 272,808, Cl. D10-111.000.
Replicap Products, Inc.: *See*—
Ruhl, Gerald F., 272,807, Cl. D9-449.000.
Richards, Richard D., to Wilkinson Sword, Limited. Packaging container for razors. 272,803, 2-28-84, Cl. D9-342.000.
Ricoh Company, Ltd.: *See*—
Kato, Takaharu, 272,829, Cl. D16-8.000.
Ruhl, Gerald F., to Replicap Products, Inc. Dispensing closure plug. 272,807, 2-28-84, Cl. D9-449.000.
Rumbaugh, James T., to Berkley and Company, Inc. Set of brackets for mounting on a wall for supporting horizontally oriented fishing rods. 272,785, 2-28-84, Cl. D6-114.000.
Rumbaugh, James T., to Berkley and Company, Inc. Bracket for mounting on a wall for supporting the butt ends of vertically oriented fishing rods. 272,787, 2-28-84, Cl. D6-125.000.
S. T. DuPont: *See*—
Malamoud, Jean G., 272,832, Cl. D19-51.000.
Sapelak, Ronald, to Clark Equipment Company. Detachable butt grill for grapple arch. 272,827, 2-28-84, Cl. D15-28.000.
Schauer, Helmut: *See*—
Burghard, Bero; and Schauer, Helmut, 272,862, Cl. D32-4.000.
Schultz, M. Richard, to Stow/Davis Furniture Company. Chair. 272,777, 2-28-84, Cl. D6-30.000.
Shelton, Robert N. Display fixture. 272,782, 2-28-84, Cl. D6-85.000.
Silva, Priscilla D. Serving dispenser for honey or the like. 272,797, 2-28-84, Cl. D7-302.000.
Simmons Universal Corporation: *See*—
Solie, O. B.; and Sonnenleiter, G. Ronald, 272,779, Cl. D6-69.000.
Solie, O. B.; and Sonnenleiter, G. Ronald, 272,780, Cl. D6-71.000.
Singer Company, The: *See*—
Kumar, Shri A.; Ljung, Bo; and Koper, James G., 272,801, Cl. D8-325.000.
Solie, O. B.; and Sonnenleiter, G. Ronald, to Simmons Universal Corporation. Chair. 272,779, 2-28-84, Cl. D6-69.000.
Solie, O. B.; and Sonnenleiter, G. Ronald, to Simmons Universal Corporation. Chair. 272,780, 2-28-84, Cl. D6-71.000.
Sonnenleiter, G. Ronald: *See*—
Solie, O. B.; and Sonnenleiter, G. Ronald, 272,779, Cl. D6-69.000.
Solie, O. B.; and Sonnenleiter, G. Ronald, 272,780, Cl. D6-71.000.
Stilson, Vern. Wind chime. 272,810, 2-28-84, Cl. D10-116.000.
Stockmaster, Edward F.: *See*—
Bean, Thomas R.; Stockmaster, Edward F.; and Whaley, George S., 272,819, Cl. D13-12.000.
Stolarz, Edward M.: *See*—
Pelavin, Joseph Y.; and Stolarz, Edward M., 272,776, Cl. D3-76.000.
Stoppino, Giotto. Tape rack. 272,789, 2-28-84, Cl. D6-189.000.
Stow/Davis Furniture Company: *See*—
Schultz, M. Richard, 272,777, Cl. D6-30.000.
Stromberg, Gary D.: *See*—
Cochran, Gary L.; Stromberg, Gary D.; Dawson, James E.; Lanphere, Ralph C.; and Klee, Maurice, 272,825, Cl. D15-25.000.
Cochran, Gary L.; Stromberg, Gary D.; Dawson, James E.; Lanphere, Ralph C.; and Klee, Maurice, 272,826, Cl. D15-25.000.
Sundahl, James G.; and Broersma, Lester V., to Bell Helmets Inc. Cyclist's vented helmet. 272,769, 2-28-84, Cl. D2-231.000.
Sundahl, James G.; and Broersma, Lester V. Cyclist's vented helmet with visor. 272,770, 2-28-84, Cl. D2-232.000.
Swatzell, Lillian, to Lilaud Products. Neck cushioning pad for sink edge. 272,860, 2-28-84, Cl. D28-20.000.
Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Hara, Kunio; and Yasutani, Shigeki, 272,830, Cl. D16-32.000.
United States Surgical Corporation: *See*—
Green, David T.; Rawson, Paul O.; and Yagami, Richard, 272,851, Cl. D24-26.000.
Green, David T.; Rawson, Paul O.; and Yagami, Richard, 272,852, Cl. D24-26.000.
van Assche, Daniel; Birgy, Claude; Kessler, Armin; and Gmelin, Gernot. Display surface of the drug effect on brain capillary blood flow and nerve impulse transmission demonstrator. 272,833, 2-28-84, Cl. D19-62.000.
W. Braun Company: *See*—
Braun, Morris, 272,804, Cl. D9-353.000.
Weissenburger, Kenneth A. Belt-attached beverage holster for bottles and cans. 272,773, 2-28-84, Cl. D2-400.000.
Weissenburger, Kenneth A. Belt-attached beverage holster for bottles and cans. 272,774, 2-28-84, Cl. D2-400.000.
Weissenburger, Kenneth A. Belt-attached beverage holster for bottles and cans. 272,775, 2-28-84, Cl. D2-400.000.
Whaley, George S.: *See*—
Bean, Thomas R.; Stockmaster, Edward F.; and Whaley, George S., 272,819, Cl. D13-12.000.
Wilkinson Sword, Limited: *See*—
Richards, Richard D., 272,803, Cl. D9-342.000.
Williams, Robert E., Jr., to Omni R & D, Inc. Speaker stand. 272,784, 2-28-84, Cl. D6-85.000.
Witte, Paul A.; Buechel, Frederick F.; and Pappas, Michael J. Distal femoral resection guide. 272,854, 2-28-84, Cl. D24-26.000.
Witte, Paul A.: *See*—
Buechel, Frederick F.; Pappas, Michael J.; and Witte, Paul A., 272,853, Cl. D24-26.000.
Wolfe, David. Solid fuel stove. 272,845, 2-28-84, Cl. D23-97.000.
Wolff, Martin J., to Dart Industries Inc. Combined corn butterer and salt dispenser. 272,796, 2-28-84, Cl. D7-99.000.
Worsham, Frank D. Voltage regulator housing for end mounting on a generator. 272,818, 2-28-84, Cl. D13-11.000.
Wright, David A.: *See*—
Birkel, Carl D.; and Wright, David A., 272,816, Cl. D12-147.000.
Yagami, Richard: *See*—
Green, David T.; Rawson, Paul O.; and Yagami, Richard, 272,851, Cl. D24-26.000.
Green, David T.; Rawson, Paul O.; and Yagami, Richard, 272,852, Cl. D24-26.000.
Yasutani, Shigeki: *See*—
Hara, Kunio; and Yasutani, Shigeki, 272,830, Cl. D16-32.000.
York, Jerry L. Sliding hammer. 272,798, 2-28-84, Cl. D8-1.000.
Zoldia Anstalt: *See*—
Bulgari, Marina, 272,811, Cl. D11-34.000.

LIST OF PLANT PATENTEES

Carrier, Leonard E. Carnation plant. 5,198, 2-28-84, Cl. 73.000.
Conard-Pyle Company, The: *See*—
Zebehazy, Alex J., 5,195, Cl. 54.000.
Kirsch, Ted T., to Sun Valley Bulb Farms, Inc. Lily named Fresco. 5,196, 2-28-84, Cl. 68.000.
Kirsch, Ted T., to Sun Valley Bulb Farms, Inc. Lily named Freedom. 5,197, 2-28-84, Cl. 68.000.
Sun Valley Bulb Farms, Inc.: *See*—
Kirsch, Ted T., 5,196, Cl. 68.000.
Kirsch, Ted T., 5,197, Cl. 68.000.
Zebehazy, Alex J., to Conard-Pyle Company, The. Leucothoe plant-zeblid variety. 5,195, 2-28-84, Cl. 54.000.

CLASSIFICATION OF PATENTS

ISSUED FEBRUARY 28, 1984

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

161 R 4,433,439

CLASS 3

36 4,433,440

CLASS 4

213 4,433,441
251 4,433,442
317 4,433,443
319 4,433,444
325 4,433,445
378 4,433,446

CLASS 5

93 R 4,433,447
~~337~~ B1 4,219,333
555 4,433,976
648 4,433,975

CLASS 15

88 4,433,448
243 4,433,449
316 R 4,433,450
321 4,433,451

CLASS 16

2 4,433,452

CLASS 17

21 4,433,453

CLASS 19

55 R 4,433,454
107 4,433,455

CLASS 24

68 SK 4,433,456
4,433,457
191 4,433,458
613 4,433,459

CLASS 26

75 4,433,460

CLASS 29

25.35 4,433,461
229 4,433,462
239 4,433,463
252 4,433,464
415 4,433,465
432 4,433,480
564.6 4,433,466
565 4,433,467
571 4,433,468
4,433,469
577 C 4,433,470
578 4,433,471
596 4,433,472
598 4,433,473
605 4,433,474
736 4,433,475
752 4,433,476
764 4,433,477
767 4,433,478
825 4,433,479
878 4,433,481
882 4,433,482

CLASS 30

41 4,433,483
90.4 4,433,484

CLASS 33

3 R 4,433,485
137 R 4,433,486
174 F 4,433,487
185 R 4,433,488
203.18 4,433,489
293 4,433,490
302 4,433,491

CLASS 34

99 4,433,492
116 4,433,493

CLASS 36

119 4,433,494

CLASS 37

103 4,433,495
141 R 4,433,496

CLASS 38

107 4,433,497

CLASS 40

2 R 4,433,498
356 4,433,499

CLASS 42

1 N 4,433,500

CLASS 43

17.2 4,433,501
42.1 4,433,503
43.2 4,433,502

CLASS 44

60 4,433,977

CLASS 46

11 4,433,504

CLASS 48

76 4,433,978

CLASS 49

110 4,433,505
141 4,433,506
213 4,433,507
348 4,433,508
352 4,433,509

CLASS 51

165 R 4,433,510
307 4,433,979
308 4,433,980
424 4,433,511

CLASS 52

11 4,433,512
36 4,433,513
94 4,433,514
115 4,433,515
126.3 4,433,516
169.11 4,433,720
204 4,433,517
211 4,433,518
233 4,433,519
275 4,433,520
302 4,433,521
426 4,433,522
592 4,433,523
665 4,433,524
741 4,433,525

CLASS 53

244 4,433,526
548 4,433,527

CLASS 55

59 4,433,981
158 4,433,982
171 4,433,983
196 4,433,984
217 4,433,985
272 4,433,986
319 4,433,987
357 4,433,988

CLASS 56

10.2 4,433,528
4,433,529
11.8 4,433,530
106 4,433,531
320.2 4,433,532
341 4,433,533

CLASS 57

22 4,433,534
229 4,433,535
233 4,433,536
264 4,433,537
328 4,433,538

CLASS 60

39.08 4,433,539
39.511 4,433,540
293 4,433,541
299 4,433,542
547.1 4,433,543
641.12 4,433,544
678 4,433,545
691 4,433,546
711 4,433,547
712 4,433,548
4,433,549

CLASS 62

6 4,433,550
13 4,433,989
22 4,433,990
87 4,433,551
93 4,433,552
94 4,433,553
112 4,433,554
154 4,433,555
293 4,433,556
324.1 4,433,557
354 4,433,559
537 4,433,558

CLASS 65

1 4,433,991
3.1 4,433,992
104 4,433,993
110 4,433,994
135 4,433,995

CLASS 66

64 4,433,560
148 4,433,561

CLASS 70

186 4,433,562
446 4,433,563

CLASS 71

92 4,433,997
94 4,433,998
087 4,433,996
100 4,433,999
103 4,434,000

CLASS 72

146 4,433,564
177 4,433,565
229 4,433,566
342 4,433,567
356 4,433,568
410 4,433,569

CLASS 73

12 4,433,570
37.5 4,433,571
116 4,433,572
155 4,433,573
200 4,433,574
202 4,433,575
204 4,433,576
290 V 4,433,577
487 4,433,578
715 4,433,579
718 4,433,580
786 4,433,581
788 4,433,582
861.33 4,433,583
861.66 4,433,584
862.34 4,433,585
862.48 4,433,586
863.54 4,433,587

CLASS 74

10.33 4,433,588
325 4,433,589
409 4,433,590
479 4,433,591
573 F 4,433,592
606 R 4,433,593
689 4,433,594
813 L 4,433,595
839 4,433,596

CLASS 75

0.5 AA 4,434,002
3 4,434,001
24 4,434,003
41 4,434,004
60 4,434,005
123 R 4,434,006
235 Re.31,526

CLASS 81

3.1 R 4,433,597

CLASS 82

2 E 4,433,598

CLASS 83

87 4,433,599
468 4,433,600

CLASS 84

1.03 4,433,601
1.06 4,433,602
1.16 4,433,603
1.19 4,433,604
299 4,433,605

CLASS 89

1.812 4,433,606
8 4,433,607
4,433,608
34 4,433,609
148 4,433,610
193 4,433,611

CLASS 91

358 R 4,433,613
376 R 4,433,614
420 4,433,615
514 4,433,612

CLASS 92

190 4,433,616

CLASS 99

305 4,433,617
455 4,433,618

CLASS 100

40 4,433,619
43 4,433,620

CLASS 101

11 4,433,621
40 4,433,622
123 4,433,623
314 4,433,624

CLASS 102

331 4,433,625
390 4,433,626

CLASS 104

95 4,433,627
172 S 4,433,628

CLASS 105

222 4,433,629

CLASS 106

26 4,434,007
271 4,434,008
290 4,434,009
291 4,434,010

CLASS 108

50 4,433,630

CLASS 110

245 4,433,631

CLASS 112

262.3 4,433,632

CLASS 114

54 4,433,633
270 4,433,634
301 4,433,635

CLASS 116

28 R 4,433,636
207 4,433,637
210 4,433,638

CLASS 118

316 4,433,639
323 4,433,640

CLASS 119

53 4,433,641
78 4,433,642
103 4,433,643

CLASS 122

114 4,433,644
136 R 4,433,645
504.2 4,433,646

CLASS 123

41.12 4,433,648
54 R 4,433,649
179 G 4,433,650
188 AA 4,433,652
188 M 4,433,651
193 H 4,433,653
196 A 4,433,656
196 R 4,433,655
198 F 4,433,657
221 4,433,658
256 4,433,659
263 4,433,647
286 4,433,660
339 4,433,661
425 4,433,654
438 4,433,662
494 4,433,663
527 4,433,664
552 4,433,665
569 4,433,666
4,433,667
597 4,433,668
620 4,433,669
644 4,433,670

CLASS 126

9 R 4,433,671
419 4,433,672
435 4,433,673
450 4,433,674

CLASS 128

6 4,433,675
57 4,433,683
69 4,433,676
4,433,677
80 A 4,433,678
80 F 4,433,679
90 4,433,680
92 E 4,433,681
153 4,433,682
203.21 4,433,684
204.26 4,433,685
303 R 4,433,686
318 4,433,687
335.5 4,433,688
346 4,433,689
660 4,433,690
4,433,691
4,433,692
721 4,433,693

CLASS 131

92 4,433,694
276 4,433,695
336 4,433,696
365 4,433,697

CLASS 134

6 4,434,011
25.4 4,434,012
56 R 4,433,698

CLASS 135

20 R 4,433,699
97 4,433,700

CLASS 136

258 4,434,318

CLASS 137

101.19 4,433,701
527.6 4,433,702
541 4,433,703

CLASS 139

66 R 4,433,704
435 4,433,705
4,433,706

CLASS 141

1 4,433,707
114 4,433,708

CLASS 145

2 R 4,433,709
4 4,433,710

CLASS 148

1.5 4,434,013
3 4,434,014
9 R 4,434,015
12.7 C 4,434,016

CLASS 149

2 4,434,017

CLASS 156

96 4,434,018
137 4,434,019
216 4,434,020
242 4,434,021
274.6 4,434,022
307.3 4,434,023
556 4,434,024
601 4,434,025

CLASS 159

1 S 4,434,026
47.1 4,434,027

CLASS 160

120 4,433,711
122 4,433,712
166 R 4,433,713
235 4,433,714

CLASS 164

423 4,433,715
448 4,433,716
454 4,433,717

CLASS 165

12 4,433,718
26 4,433,719
162 4,433,721
4,433,722
166 4,433,723

CLASS 166

60 4,433,724
65 R 4,433,725
118 4,433,726
252 4,433,727
270 4,433,728
4,433,729
274 4,433,730
293 4,433,731
324 B1 4,161,219

CLASS 169

48 4,433,732
49 4,433,733

CLASS 172

68 4,433,734
443 4,433,735

CLASS 173

94 4,433,736

CLASS 174

13 4,434,319
23 R 4,434,320
68.5 4,434,321

CLASS 175

5 4,433,737
61 4,433,738
410 4,433,739

CLASS 177

187 4,433,740
199 4,433,741
229 4,433,742

CLASS 178

22.13 4,434,322
22.17 4,434,323
69 R 4,434,324

CLASS 179

2 DP 4,434,326
20 4,434,328
111 E 4,434,327
121 R 4,434,329

CLASS 180

41 4,433,743
65 E 4,433,744
118 4,433,745
171 4,433,746
227 4,433,747
247 4,433,748

CLASS 181

151 4,433,749
179 4,433,750
213 4,433,751

CLASS 182

82 4,433,752
151 4,433,753
172 4,433,754

CLASS 187

20 4,433,755
29 R 4,433,756

CLASS 188

1.11 4,433,757
196 R 4,433,758
282 4,433,759

CLASS 190

109 4,433,761
115 4,433,760

CLASS 192

0.098 4,433,769
4 A 4,433,762
4,433,763
18 R 4,433,764
41 S 4,433,765
50 4,433,766
67 P 4,433,767
98 4,433,768
106.2 4,433,770
4,433,771

CLASS 194

59 4,433,772

CLASS 196

14.52 4,434,028

CLASS 198

467 4,433,773
689 4,433,774
742 4,433,775
779 4,433,776
834 4,433,777

CLASS 200

67 DA 4,434,330
144 AP 4,434,332
4,434,333
144 B 4,434,331
148 E 4,434,335
148 R 4,434,334
150 G 4,434,336
220 4,434,337
276 4,434,338
295 4,434,339
332 4,434,340

CLASS 202

153 4,434,034

CLASS 203

42 4,434,029

CLASS 204

43 T 4,434,030
59 R 4,434,031
72 4,434,032
95 4,434,033
159.13 4,434,035
164 4,434,036
192 R 4,434,037
4,434,038
196 4,434,039
206 4,434,040
296 4,434,041
298 4,434,042

CLASS 206

45.25 4,433,778
220 4,433,779
232 4,433,780
314 4,433,781
338 4,433,782
484 4,433,783
617 4,433,784

CLASS 208

10 4,434,043
91 4,434,044
107 4,434,045
111 4,434,046
4,434,047
112 4,434,048
153 4,434,049

CLASS 209

531 4,433,785

CLASS 210

169 4,434,050
264 4,434,051
376 4,434,052
446 4,434,053
484 4,434,054
489 4,434,055
637 4,434,056
638 4,434,057
662 4,434,058
701 4,434,059
724 4,434,060
787 4,434,061

CLASS 211

5 4,433,786
4,433,787
26 4,433,788

CLASS 215

220 4,433,789
246 4,433,790

CLASS 219

10.55 A 4,434,341
10.55 E 4,434,344
10.55 F 4,434,343
10.55 M 4,434,342
10.55 R 4,434,345
56.22 4,434,347
61 4,434,348
69 C 4,434,346
117.1 4,434,351
121 LC 4,434,350
121 LG 4,434,349
125.12 4,434,352
216 4,434,353
4,434,354
4,434,355
4,434,356
291 4,434,357
501 4,434,358

CLASS 220

89 A 4,433,791
269 4,433,792
276 4,433,793

CLASS 221

224 4,433,794

CLASS 222

14 4,433,795
135 4,433,796
207 4,433,797
255 4,433,798
309 4,433,799
547 4,433,800

CLASS 224

148 4,433,801
153 4,433,802
251 4,433,803
321 4,433,804

CLASS 228

180 R 4,433,805

CLASS 229

40 4,433,806
4,433,807
43 4,433,808

CLASS 235

192 4,434,361
379 4,434,359
472 4,434,360

CLASS 236

47 4,433,809

CLASS 237

8 R 4,433,810

CLASS 239

74 4,433,811
290 4,433,812

CLASS 241

21 4,433,813

CLASS 242

72.1 4,433,814
118 4,433,815
129.62 4,433,816
134 4,433,817

CLASS 244

3.13 4,433,818
12.2 4,433,819
102 R 4,433,820

CLASS 248

65 4,433,821
210 4,433,822
346.1 4,433,823
581 Re.31,525
662 4,433,824
672 4,433,825

CLASS 249

38 4,433,826

CLASS 250

201 4,434,362
214 B 4,434,363
253 4,434,364
255 4,434,365
308 4,434,366
311 4,434,367
339 4,434,368
363 S 4,434,369
370 4,434,370
396 R 4,434,371
400 4,434,372
506.1 4,434,373

CLASS 251

191 4,433,827

CLASS 252

8.55 D 4,434,062
25 4,434,063
29 4,434,064
75 4,434,065
77 4,434,066
88 4,434,067
135 4,434,068
174.14 4,434,069
182 4,434,071
299.1 4,434,072
299.62 4,434,073
315.2 4,434,075
4,434,076
357 4,434,077
4,434,078
412 4,434,079
512 4,434,084
522 R 4,434,085
4,434,086
545 4,434,087
547 4,434,088
4,434,089
4,434,090
557 4,434,091
626 4,434,092
628 4,434,074

CLASS 254

29 A 4,433,828
131 4,433,829
264 4,433,830

CLASS 256

39 4,433,831

CLASS 260

112 B 4,434,093
112 R 4,434,094
112.5 R 4,434,095
4,434,096
4,434,097
239 A 4,434,099
239 R 4,434,098
330.3 4,434,100
410.9 R 4,434,101
429.7 4,434,102
448 B 4,434,103
456 P 4,434,104
463 4,434,105
465.5 R 4,434,106
501.12 4,434,107
951 4,434,108
958 4,434,109

CLASS 261

36 A 4,434,110
44 C 4,434,111
153 4,434,112

CLASS 264

2.1 4,434,113
22 4,434,114
36 4,434,115
49 4,434,116
56 4,434,117
109 4,434,118
145 4,434,119
155 4,434,120
174 4,434,121
211 4,434,122
225 4,434,123
229 4,434,124
236 4,434,127
262 4,434,125
303 4,434,126
557 4,434,129
560 4,434,128

CLASS 266

87 4,433,832

CLASS 267

18 4,433,833
141.1 4,433,834

CLASS 269

14 4,433,835

CLASS 271

3.1 4,433,836
293 4,433,837

CLASS 272

65 4,433,838

CLASS 273

1.5 R 4,433,839
61 R 4,433,840
143 R 4,433,844
338 4,433,841
363 4,433,842
407 4,433,843

CLASS 277

1 4,433,845
9 4,433,846
125 4,433,847
199 4,433,848

CLASS 280

6 R 4,433,849
277 4,433,850
4,433,851
278 4,433,852
415 R 4,433,853
511 4,433,854
609 4,433,855
668 4,433,856
690 4,433,857
802 4,433,858

CLASS 285

34 4,433,859
192 4,433,860
305 4,433,861
350 4,433,862

CLASS 290

1 R 4,434,374
53 4,434,375

CLASS 294

19 R 4,433,863
27 H 4,433,864

CLASS 296

1 S 4,433,865
76 4,433,866
146 4,433,867
190 4,433,868

CLASS 297

5 4,433,869
16 4,433,870

CLASS 299

41 4,433,871

CLASS 303

22 A 4,433,872
24 A 4,433,873

CLASS 305

53 4,433,874

CLASS 307

102 4,434,376
147 4,434,377
350 4,434,378
448 4,434,379
491 4,434,380
530 4,434,381

CLASS 308

6 C 4,433,876
6 R 4,433,875
191 4,433,877
203 4,433,878
244 4,433,879

CLASS 310

51 4,434,382
313 R 4,434,383
325 4,434,384

CLASS 312

3 4,433,880
107.5 4,433,881
111 4,433,882
234.1 4,433,883
256 4,433,884
305 4,433,885

CLASS 313

161 4,434,385
331 4,434,386

CLASS 315

39.3 4,434,387
307 4,434,388

CLASS 318

254 4,434,389
473 4,434,390
662 4,434,391
696 4,434,392
757 4,434,393
771 4,434,394

CLASS 320

1 4,434,395

CLASS 323

230 4,434,396

CLASS 324

58 R 4,434,397
71.4 4,434,398
96 4,434,399
110 4,434,400
158 SC 4,434,401
393 4,434,402

CLASS 328

120 4,434,403

CLASS 330

85 4,434,404
149 4,434,405

CLASS 331

3 4,434,406
4 4,434,407
111 4,434,408

CLASS 333

24.1 4,434,409
224 4,434,410

CLASS 335

208 4,434,411

CLASS 336

134 4,434,412

CLASS 337

71 4,434,413
102 4,434,414
186 4,434,415

CLASS 338

22 R 4,434,416
53 4,434,417

CLASS 339

14 R 4,433,886
17 R 4,433,887
91 R 4,433,888
94 M 4,433,889
97 C 4,433,890
217 R 4,433,891
258 P 4,433,892

CLASS 340

606 4,434,418
717 4,434,419
724 4,434,420
825.51 4,434,421

CLASS 343

5 SC 4,434,422
372 4,434,426
381 4,434,424
406 4,434,423
797 4,434,425

CLASS 346

33 P 4,434,427
75 4,434,428
135.1 4,434,429
140 R 4,434,430
154 4,434,431
4,434,432

CLASS 350

3.61 4,433,893
6.8 4,433,894
96.13 4,433,895
96.17 4,433,898
96.21 4,433,896
252 4,433,897
307 4,433,899
331 R 4,433,900
357 4,433,901

CLASS 354

10 4,433,902
266 4,433,903

CLASS 355

3 DD 4,433,904
3 SH 4,433,905
55 4,433,906
4,433,907
68 4,433,908
75 4,433,909
76 4,433,910
125 4,433,911

CLASS 356

133 4,433,913
150 4,433,912
223 4,433,914
350 4,433,915

CLASS 357

22 4,434,433
71 4,434,434

CLASS 358

44 4,434,435
118 4,434,436
140 4,434,437
167 4,434,438
174 4,434,439
186 4,434,440
213 4,434,441

CLASS 360

74.2 4,434,442
74.4 4,434,443
96.5 4,434,444
121 4,434,445
125 4,434,446
137 4,434,447

CLASS 361

23 4,434,448
124 4,434,449
152 4,434,450
283 4,434,451
304 4,434,452

CLASS 362

33 4,434,453
238 4,434,454
307 4,434,455
374 4,434,456

CLASS 363

133 4,434,457

CLASS 364

138 4,434,458
200 4,434,459
4,434,460
4,434,461
4,434,462
4,434,463
4,434,464
4,434,465
4,434,466
400 4,434,467
424 4,434,468
426 4,434,469
565 4,434,470
900 4,434,471
4,434,472
4,434,473
4,434,474
4,434,475

CLASS 365

12 4,434,476
120 4,434,477
185 4,434,478
210 4,434,479

CLASS 366

114 4,433,916
132 4,433,917

CLASS 368

74 4,433,918
120 4,433,919
201 4,433,920
294 4,433,921

CLASS 369

77.2 4,434,480
132 4,434,481
230 4,434,482
255 4,434,483
271 4,434,484

CLASS 370

55 4,434,485
110.1 4,434,486

CLASS 371

10 4,434,487
15 4,434,488
29 4,434,489

CLASS 372

20 4,434,490
48 4,434,491
59 4,434,492
86 4,434,493

CLASS 373

18 4,434,494
76 4,434,495
96 4,434,496

CLASS 374

2 4,433,924
36 4,433,922
112 4,433,923

CLASS 375

7 4,434,497
114 4,434,498
122 4,434,499

CLASS 376

107 4,434,130
130 4,434,131
259 4,434,132
323 4,434,133

CLASS 378

99 4,434,500
187 4,434,501

CLASS 381

104 4,434,325

CLASS 382

41 4,434,502
48 4,434,503

CLASS 400

88 4,433,925
124 4,433,926
4,433,927

CLASS 401

122 4,433,928

CLASS 402

14 4,433,929

CLASS 403

12 4,433,930
194 4,433,931
261 4,433,932
268 4,433,933
318 4,433,934
385 4,433,935

CLASS 404

88 4,433,936

CLASS 405

137 4,433,937
166 4,433,938
195 4,433,939
210 4,433,940
211 4,433,941
215 4,433,942
241 4,433,943
284 4,433,944
302 4,433,945

CLASS 406

43 4,433,946
99 4,433,947

CLASS 407

42 4,433,948

CLASS 411

477 4,433,949

CLASS 414

9 4,433,950
217 4,433,951
460 4,433,952
735 4,433,953
757 4,433,954

CLASS 415

1 4,433,955

CLASS 417

571 4,433,966

CLASS 418

140 4,433,967

CLASS 419

5 4,434,134

CLASS 422

150 4,434,135
263 4,434,136

CLASS 423

6 4,434,137
7 4,434,138
19 4,434,139
54 4,434,140
4,434,141
111 4,434,142
223 4,434,144
226 4,434,143
4,434,145
4,434,146
235 4,434,147
379 4,434,148
496 4,434,149

CLASS 424

1.1 4,434,150
4,434,151
19 4,434,152
22 4,434,153
47 4,434,155
60 4,434,154
85 4,434,156
89 4,434,157
94 4,434,158
178 4,434,159
180 4,434,160
184 4,434,161
200 4,434,162
246 4,434,163
4,434,164
248.4 4,434,165
250 4,434,166
251 4,434,167
260 4,434,168
263 4,434,169
265 4,434,170
267 4,434,171
270 4,434,172
271 4,434,173
273 B 4,434,174
274 4,434,175
4,434,176
280 4,434,177
287 4,434,178
308 4,434,179
317 4,434,180
326 4,434,181
327 4,434,182
340 4,434,183

CLASS 425

392 4,433,968
548 4,433,969

CLASS 426

40 4,434,184
308 4,434,185
565 4,434,186
652 4,434,187

CLASS 427

39 4,434,188
53.1 4,434,189
136 4,434,190
165 4,434,191
282 4,434,192
299 4,434,193
356 4,434,194
387 4,434,195
389 4,434,196
407.1 4,434,197

CLASS 428

43 4,434,198
134 4,434,199
137 4,434,201
143 4,434,202
152 4,434,203
198 4,434,204
218 4,434,205
257 4,434,200
288 4,434,206
343 4,434,207
378 4,434,208
416 4,434,209
447 4,434,210
552 4,434,211
693 4,434,212

CLASS 429

3 4,434,213
59 4,434,214
144 4,434,215
191 4,434,216

CLASS 430

9 4,434,217
96 4,434,218
4,434,219
108 4,434,220
122 4,434,221
135 4,434,222
273 4,434,223
323 4,434,224
544 4,434,225
567 4,434,226

CLASS 431

8 4,433,970

CLASS 433

7 4,433,956
105 4,433,957
199 4,433,958
201 4,433,959
215 4,433,960

CLASS 434

274 4,433,961

CLASS 435

7 4,434,227
108 4,434,228
174 4,434,229
240 4,434,230
253 4,434,231
288 4,434,232

CLASS 436

60 4,434,233
86 4,434,234
110 4,434,235
512 4,434,236
542 4,434,237

CLASS 445

6 4,433,962

CLASS 455

32 4,434,504
50 4,434,505
53 4,434,506
95 4,434,507
306 4,434,508
343 4,434,509
603 4,434,510

CLASS 474

80 4,433,963
152 4,433,964
201 4,433,965

CLASS 501

98 4,434,238
118 4,434,239

CLASS 502

2 4,434,245
24 4,434,240
4,434,241
107 4,434,242
152 4,434,080
154 4,434,081
4,434,083
164 4,434,082
171 4,434,243
209 4,434,244

CLASS 518

700 4,434,246
4,434,247
4,434,248

CLASS 521

27 4,434,249
64 4,434,250
75 4,434,251
134 4,434,252
4,434,253

CLASS 523

105 4,434,254
209 4,434,255
323 4,434,070
402 4,434,256

CLASS 524

5 4,434,257
13 4,434,258
31 4,434,259
104 4,434,260
109 4,434,261
237 4,434,262
322 4,434,263
323 4,434,264
339 4,434,265
425 4,434,266
458 4,434,267
520 4,434,268
538 4,434,269
570 4,434,270
575 4,434,271

CLASS 525

100 4,434,272
326.2 4,434,273
349 4,434,274
403 4,434,275
437 4,434,276
507 4,434,277
531 4,434,278

CLASS 526

66 4,434,279
106 4,434,280
119 4,434,281
125 4,434,282

CLASS 528

34 4,434,283
58 4,434,284
86 4,434,285
297 4,434,286

CLASS 544

16 4,434,287
54 4,434,288

CLASS 546

14 4,434,289
70 4,434,290

CLASS 548

116 4,434,291
373 4,434,292

CLASS 549

17 4,434,293
65 4,434,294
344 4,434,295
471 4,434,296

CLASS 560

236 4,434,297

CLASS 562

599 4,434,298

CLASS 564

396 4,434,299
479 4,434,300

CLASS 568

366 4,434,301
454 4,434,302
686 4,434,303
710 4,434,304
768 4,434,305
820 4,434,306

CLASS 585

4 4,434,307
10 4,434,308
4,434,309
377 4,434,310
444 4,434,311
523 4,434,312
527 4,434,313
640 4,434,314
671 4,434,315
833 4,434,316
845 4,434,317

CLASS 604

122 4,433,971
385 4,433,972
403 4,433,973
407 4,433,974

CLASSIFICATION OF DESIGNS

D2— 231 272,769
232 272,770
311 272,771
320 272,772
400 272,773
272,774
272,775
D3— 76 272,776
D6— 30 272,777
31 272,778
69 272,779
71 272,780
75 272,781
85 272,782
272,783
272,784
114 272,785
125 272,786
272,787
176 272,788
189 272,789
210 272,790
234 272,791
248 272,792
D7— 5 272,793
6 272,794
78 272,795
99 272,796
302 272,797
D8— 1 272,798
10 272,799
318 272,800
325 272,801
396 272,802
D9— 342 272,803
353 272,804
415 272,805
416 272,806
449 272,807
D10— 109 272,809
111 272,808
116 272,810
D11— 34 272,811
162 272,812
D12— 15 272,813
114 272,814
146 272,815
147 272,816
155 272,817
D13— 11 272,818
12 272,819
272,821
24 272,820
32 272,822
D14— 66 272,823
71 272,824
D15— 25 272,825
272,826
28 272,827
140 272,828
D16— 8 272,829
32 272,830
D18— 1 272,831
D19— 51 272,832
62 272,833
75 272,834
D21— 48 272,835
59 272,836
71 272,837
75 272,838
87 272,839
104 272,840
272,841
272,842
171 272,843
D23— 77 272,844
97 272,845
139 272,846
166 272,847
272,848
D24— 18 272,849
24 272,850
26 272,851
272,852
272,853
272,854
28 272,855
99 272,856
D25— 68 272,857
D26— 80 272,858
D27— 42 272,859
D28— 20 272,860
93 272,861
D32— 4 272,862
D34— 17 272,863

CLASSIFICATION OF PLANTS

P.— 54 5,195
68 5,196
5,197
73 5,198

GEOGRAPHICAL INDEX
OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

1 : 4,433,454
4 : 4,433,781
4,433,961
4,434,130
4,434,149
4,434,383
4,434,391
6 : 4,433,471
4,433,484
4,433,487
4,433,489
4,433,491
4,433,503
4,433,544
4,433,575
4,433,580
4,433,598
4,433,603
4,433,609
4,433,672
4,433,682
4,433,683
4,433,713
4,433,723
4,433,737
4,433,792
4,433,829
4,433,835
4,433,838
4,433,841
4,433,856
4,433,898
4,433,914
4,433,939
4,433,985
4,433,997
4,433,999
4,434,042
4,434,050
4,434,069
4,434,106
4,434,110
4,434,184
4,434,185
4,434,304
4,434,318
4,434,376
4,434,384
4,434,404
4,434,406
4,434,418
4,434,419
4,434,490
4,434,507
4,219,333
8 : 4,433,457
4,433,711
4,433,729
4,433,854
4,434,038
4,434,049
4,434,193
4,434,220
9 : 4,433,539
4,433,584
4,433,712
4,433,765
4,433,845
4,433,923
4,434,066
4,434,163
4,434,164
4,434,173
4,434,330
4,434,346
04 : 4,433,557
4,433,655
4,433,800
4,433,831
4,433,863
4,433,894
4,434,436
05 : 4,433,578
4,434,026
06 : 4,433,459
4,433,492
4,433,570
4,433,581
4,433,597
4,433,601
4,433,606
4,433,615
4,433,649
4,433,664
4,433,690
4,433,703
4,433,707
4,433,726
4,433,733
4,433,795
4,433,799
4,433,848
4,433,852
4,433,882
4,433,930
4,433,940
4,433,941
4,433,951
4,434,010
4,434,013
4,434,037
4,434,094
4,434,140
4,434,141
4,434,147
4,434,151
4,434,153
4,434,156
4,434,222
4,434,293
4,434,311
4,434,328
4,434,371
4,434,414
4,434,425
4,434,454
4,434,467
4,434,472
08 : 4,433,727
4,433,728
4,433,761
4,433,909
4,434,362
4,434,487
09 : 4,433,741
4,433,836
4,433,842
4,433,937
4,434,016
4,434,092
10 : 4,433,509
4,433,527
4,434,236
4,434,258
4,434,261
12 : 4,433,660
4,433,720
4,433,809
4,433,840
4,433,949
4,433,950
4,434,060
4,434,345
4,434,374
4,434,378
13 : 4,433,864
4,434,021
4,434,067
4,434,120
17 : Re.31,525
4,433,452
4,433,486
4,433,502
4,433,531
4,433,532
4,433,590
4,433,594
4,433,621
4,433,629
4,433,698
4,433,709
4,433,750
4,433,754
4,433,762
4,433,780
4,433,787
4,433,826
4,433,844
4,433,846
4,433,878
4,433,883
4,433,919
4,433,952
4,434,020
4,434,051
4,434,059
4,434,064
4,434,227
4,434,244
4,434,245
4,434,270
4,434,323
4,434,398
4,434,415
4,434,420
4,434,438
4,434,461
18 : 4,433,466
4,433,501
4,433,549
4,433,996
4,434,047
4,434,288
4,434,448
4,434,470
19 : 4,433,616
4,433,619
4,433,641
4,433,853
4,434,018
4,434,474
20 : 4,433,513
4,433,552
4,433,625
4,433,753
4,433,816
4,434,504
21 : 4,433,490
4,433,518
4,434,044
4,434,207
4,434,278
4,434,344
4,434,356
22 : 4,433,464
4,433,553
4,433,634
4,433,638
4,433,738
4,434,015
4,434,282
23 : 4,434,347
24 : 4,433,441
4,433,589
4,433,684
4,433,796
4,433,989
4,434,168
4,434,215
4,434,228
4,434,253
4,434,407
4,434,486
25 : 4,433,439
4,433,476
4,433,493
4,433,610
4,433,643
4,433,687
4,433,739
4,433,742
4,433,791
4,433,814
4,433,924
4,433,962
4,433,979
4,433,984
4,434,025
4,434,028
4,434,074
4,434,150
4,434,203
4,434,217
4,434,237
4,434,287
4,434,343
4,434,380
4,434,386
4,434,387
4,434,409
4,434,459
4,434,479
4,434,482
26 : 4,433,450
4,433,506
4,433,520
4,433,540
4,433,572
4,433,576
4,433,583
4,433,627
4,433,648
4,433,693
4,433,763
4,433,764
4,433,785
4,433,804
4,433,812
4,433,819
4,433,858
4,433,867
4,433,884
4,433,885
4,433,934
4,433,935
4,433,953
4,433,971
4,434,000
4,434,053
4,434,065
4,434,077
4,434,078
4,434,096
4,434,124
4,434,127
4,434,169
4,434,187
4,434,195
4,434,234
4,434,238
4,434,295
4,434,296
4,434,342
4,434,375
4,434,468
27 : 4,433,453
4,433,526
4,433,559

4,433,631
4,433,691
4,433,767
4,433,818
4,433,880
4,433,915
4,433,929
4,433,946
4,433,956
4,433,968
4,433,980
4,434,186
4,434,199
4,434,230
4,434,338
28 : 4,433,959
29 : 4,433,514
4,433,735
4,434,019
30 : 4,434,180
33 : 4,433,632
4,433,640
34 : 4,433,443
4,433,469
4,433,474
4,433,571
4,433,652
4,433,680
4,433,695
4,433,715
4,433,756
4,433,760
4,433,776
4,433,778
4,433,783
4,433,790
4,433,806
4,433,807
4,433,817
4,433,964
4,433,970
4,433,987
4,434,031
4,434,046
4,434,048
4,434,062
4,434,075
4,434,076
4,434,085
4,434,086
4,434,093
4,434,100
4,434,101
4,434,102
4,434,155
4,434,161
4,434,174
4,434,175

4,434,182
4,434,200
4,434,240
4,434,254
4,434,259
4,434,262
4,434,264
4,434,271
4,434,272
4,434,275
4,434,297
4,434,299
4,434,312
4,434,313
4,434,317
4,434,327
4,434,381
4,434,405
4,434,411
4,434,416
4,434,439
4,434,440
4,434,449
4,434,481
4,434,497
4,434,505
4,434,510
35 : 4,433,558
4,434,034
36 : 4,433,482
4,433,512
4,433,545
4,433,563
4,433,567
4,433,585
4,433,595
4,433,602
4,433,657
4,433,658
4,433,685
4,433,710
4,433,718
4,433,808
4,433,810
4,433,824
4,433,837
4,433,889
4,433,890
4,433,892
4,433,899
4,433,907
4,433,910
4,433,912
4,433,917
4,433,960
4,433,967
4,433,972

4,433,973
4,433,990
4,434,003
4,434,055
4,434,084
4,434,098
4,434,103
4,434,118
4,434,134
4,434,158
4,434,197
4,434,216
4,434,226
4,434,233
4,434,353
4,434,366
4,434,369
4,434,372
4,434,396
4,434,397
4,434,399
4,434,421
4,434,422
4,434,426
4,434,432
4,434,434
37 : 4,433,697
4,434,456
38 : 4,433,519
39 : 4,433,445
4,433,477
4,433,481
4,433,499
4,433,500
4,433,517
4,433,591
4,433,624
4,433,633
4,433,636
4,433,637
4,433,645
4,433,646
4,433,674
4,433,757
4,433,758
4,433,775
4,433,802
4,433,832
4,433,834
4,433,860
4,433,872
4,433,879
4,433,888
4,433,922
4,433,931
4,433,955
4,434,032
4,434,116

4,434,119
4,434,126
4,434,136
4,434,157
4,434,189
4,434,255
4,434,265
4,434,266
4,434,274
4,434,298
4,434,320
4,434,348
4,434,358
4,434,388
40 : 4,433,582
4,433,701
4,433,731
4,433,983
4,434,079
4,434,082
4,434,122
4,434,243
4,434,263
4,434,280
4,434,364
41 : 4,433,449
4,433,496
4,433,548
4,433,556
4,434,142
4,434,286
4,434,488
42 : 4,433,515
4,433,528
4,433,566
4,433,607
4,433,608
4,433,622
4,433,644
4,433,777
4,433,789
4,433,822
4,433,828
4,433,830
4,433,865
4,433,869
4,433,870
4,433,886
4,433,958
4,433,978
4,433,993
4,434,007
4,434,012
4,434,040
4,434,061
4,434,112
4,434,114
4,434,132

4,434,133
4,434,177
4,434,183
4,434,191
4,434,208
4,434,267
4,434,273
4,434,279
4,434,281
4,434,284
4,434,300
4,434,334
4,434,336
4,434,370
4,434,382
4,434,390
4,434,394
4,434,401
4,434,437
4,434,453
4,434,458
43 : 4,433,891
44 : 4,433,903
4,434,039
45 : 4,433,536
4,433,678
4,433,811
4,433,933
47 : 4,433,749
4,433,928
4,434,033
4,434,041
4,434,131
4,434,154
4,434,241
48 : 4,433,448
4,433,462
4,433,497
4,433,511
4,433,551
4,433,587
4,433,604
4,433,673
4,433,679
4,433,702
4,433,803
4,433,821
4,433,827
4,433,847
4,433,859
4,433,862
4,433,881
4,433,896
4,433,977
4,433,981
4,434,011
4,434,043
4,434,045

4,434,113
4,434,125
4,434,138
4,434,242
4,434,246
4,434,248
4,434,307
4,434,308
4,434,309
4,434,316
4,434,360
4,434,427
4,434,451
4,434,462
4,434,465
4,434,475
4,434,485
4,161,219
49 : 4,433,730
4,434,493
50 : 4,434,478
51 : 4,433,440
4,433,550
4,433,681
4,433,696
4,433,700
4,433,801
4,434,071
4,434,389
4,434,450
4,434,508
4,434,509
53 : 4,433,547
4,433,719
4,433,786
4,433,839
4,433,855
4,433,916
4,434,249
4,434,322
4,434,455
54 : 4,433,656
4,434,247
4,434,301
55 : 4,433,446
4,433,463
4,433,524
4,433,529
4,433,530
4,433,668
4,433,732
4,433,774
4,433,843
4,433,868
4,433,874
4,434,181
4,434,194
4,434,213

DESIGN PATENTS

02 : 272,860
04 : 272,813
06 : 272,769
272,770
272,786
272,792
272,799
272,809
272,821
272,823
272,835
272,839

272,861
08 : 272,838
272,857
09 : 272,851
272,852
17 : 272,779
272,780
272,800
272,804
272,834
272,847
272,848

272,850
272,858
19 : 272,785
272,787
272,802
272,825
272,826
25 : 272,782
26 : 272,794
272,817
272,846
27 : 272,791

272,844
29 : 272,805
34 : 272,776
272,793
272,801
272,837
272,843
272,853
272,856
36 : 272,771
272,773

272,774
272,775
272,778
272,783
272,806
272,822
37 : 272,818
39 : 272,788
272,807
272,816
272,819

40 : 272,836
42 : 272,777
272,810
272,820
272,854
44 : 272,796
47 : 272,784
48 : 272,798
272,863
51 : 272,790
53 : 272,797

PLANT PATENTS

06 : 5,198
39 : 5,195
41 : 5,196
5,197

U.S. GOVERNMENT PRINTING OFFICE : O—1984

CHANGE OF ADDRESS FORM

NAME—FIRST, LAST

COMPANY NAME OR ADDITIONAL ADDRESS LINE

STREET ADDRESS

CITY | STATE | ZIP CODE

PLEASE PRINT OR TYPE

(or) COUNTRY

Mail this form to: NEW ADDRESS

Superintendent of Documents
Government Printing Office SSOM
Washington, D.C. 20402

Attach last subscription label here.

SUBSCRIPTION ORDER FORM

SUBSCRIPTION ORDER FORM

ENTER MY SUBSCRIPTION TO:

@ $ Domestic; @ $ Foreign.

NAME—FIRST, LAST

COMPANY NAME OR ADDITIONAL ADDRESS LINE

STREET ADDRESS

CITY | STATE | ZIP CODE

PLEASE PRINT OR TYPE

(or) COUNTRY

☐ Remittance Enclosed (Make checks payable to Superintendent of Documents)

☐ Charge to my Deposit Account No. .....

MAIL ORDER FORM TO:
Superintendent of Documents
Government Printing Office
Washington, D.C. 20402